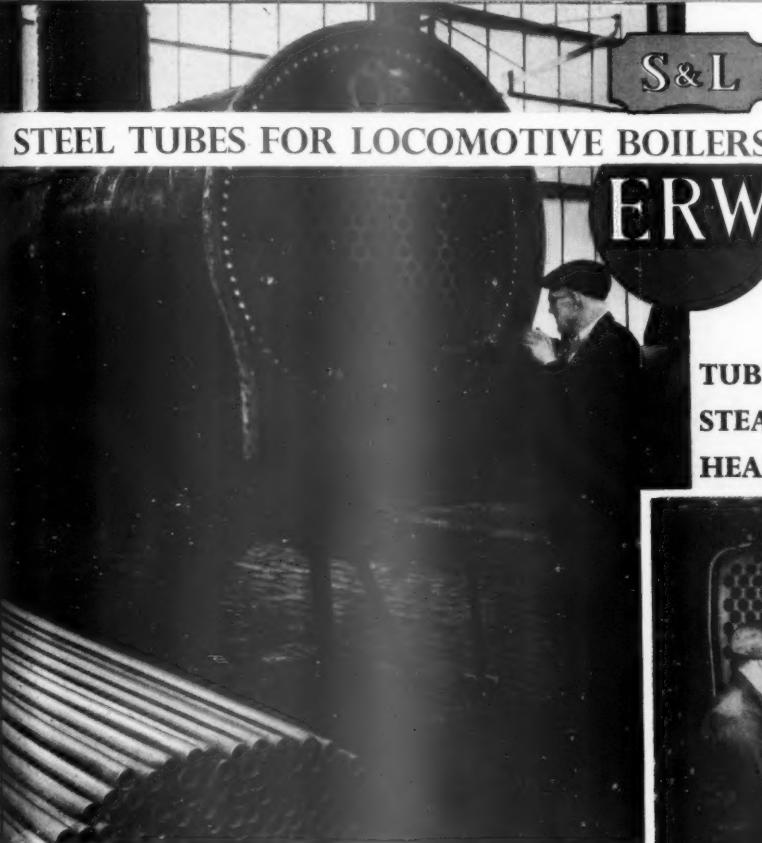


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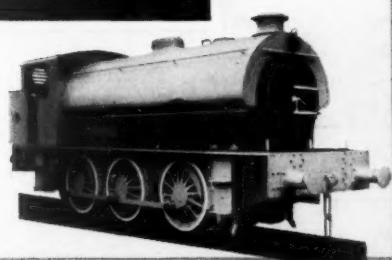
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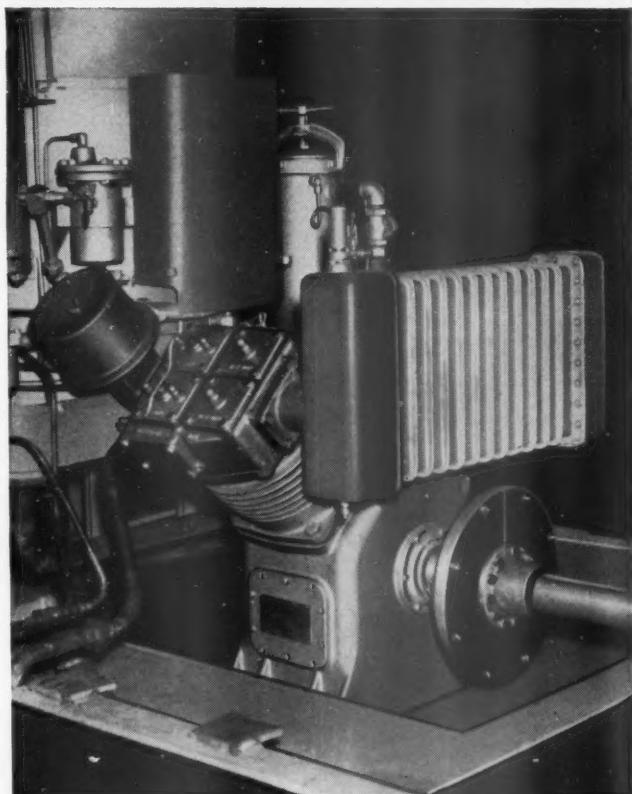
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BRISTOL: 8, Upper Berkeley Place, Clifton . . . . . Bristol 21930  
Annually £5 by post. Single copies, Two shillings.

Registered at the G.P.O. as a newspaper. Entered as second-class matter in U.S.A.

Editor: B. W. C. Cooke, Assoc. Inst. T.

Vol. 107 FRIDAY, NOVEMBER 1, 1957 [No. 18]

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Government Policy for British Railways

DURING the economic debate in the House of Commons last Tuesday, Mr. Peter Thorneycroft, Chancellor of the Exchequer, declared that the restrictions of investment by the British Transport Commission to £170 million in each of the next two years "should not materially affect the advance of British Railways towards solvency." This amount is for the Commission as a whole, and it can only be assumed, in the absence of a breakdown of the figure, that railway investment is to be limited to the amount being spent in the current year, namely £120 million, a reduction of £35 million over the next two years on the programme announced in the 1956 White Paper on proposals for the railways. If this is the case, investment by the Commission in other than railway activities must be at the rate of £50 million or so a year. It is impossible to check this figure because the Commission does not make public its investment programme, but it seems very high. Whether this other investment is really enough to account for the discrepancy between the figure given by the Chancellor and those of the White Paper must be doubted. He stated that financial aid to the Commission in 1958 to meet the deficits incurred in 1957 would be limited to the amount of those deficits, and that for 1959 advances would be reduced in accordance

with the forecast of earnings given in the White Paper. This indicates that the Government will not finance railway wage increases, and that the Government view is that if wages are increased, activity will have to be reduced in accordance with the policy for the rest of industry, which in certain industries might result in unemployment, or at least reduction of overtime payments—a consideration which might well be borne in mind by the unions. At least the Commission has been given some lead in dealing with the wage demands now before it. If the Treasury will not increase its loans to meet higher wages, the latter cannot be paid unless more revenue can be earned or expenditure can be reduced. The trend of railway freight traffic suggests that increase of most charges would do more harm than good, but it might be possible to increase passenger fares to some extent. A reduction in immediate home demands emphasises the wisdom of those suppliers of railway material which, despite pressing demands from the Commission, have maintained their overseas connections. A more heartening prospect is the consideration that steady, if reduced, demands for materials over a slightly longer period may be more acceptable than a short-term order. Speaking at Thornby last week, Mr. Harold Watkinson, Minister of Transport & Civil Aviation, stated that he relied on the railways to make their full contribution to curing inflation and increasing national efficiency "not in the distant future but at once." He described the reduction of capital investment as a direct challenge to the Commission and all who work for it. If the present difficulties are to be met, the first step must be the exercise of restraint by the railway trade unions. As we went to press, Mr. Watkinson stated in Parliament that the plan could not be accelerated, but as it was ahead of schedule any cuts would not affect overall progress.

International Bank Loans for Railways

THE annual report of the International Bank for Reconstruction & Development for the year ended June 30 last contains a list of loans up to that date and also some account of progress made in projects supported by the Bank. A total of U.S. \$715 million has now been lent by the Bank for transport schemes, including \$353 million for railways. Of this total, \$117 million has been lent to Africa, \$80 million to Asia, \$26 million to Australia, \$3 million to Europe, and \$127 to countries of the Western Hemisphere. The results of the loans for railway work in Australia have been particularly striking, most of the money having been applied to the conversion of lines to diesel traction, including the 1,100-mile transcontinental line of the Commonwealth Railways. During the year, the Peruvian Corporation asked for a loan for the rehabilitation and modernisation of the Southern and Central Railways of Peru, which it owns and operates. Since the report was published, a technical mission from the Bank has arrived in Nigeria to discuss the possibility of a loan for the proposed 400-mile railway extension from Kuru to Maiduguri, as reported last week.

Equipping the Spanish Railways

THE credit of \$8,000,000 approved by the Import-Export Bank for the R.E.N.F.E. is to be devoted to equipment supplied from the U.S.A. It is reported that 22 diesel-electric locomotives and signalling apparatus will be used in Galicia, on the heavily-graded lines between Ponferrada and the ports of Corunna and Vigo. This would seem to imply diesel haulage of a high proportion of trains on these sections. It remains to be seen how far the R.E.N.F.E. will do the same on other lines. Shortage of coal and the existence of water power make Spain a suitable field for electric traction. Broadly speaking, the most heavily trafficked sections have been electrified, or are in process of, or scheduled for, conversion. The main lines already converted are in mountainous districts, but the Madrid-Cordova line, in which electrification is proceeding, includes many miles of line on the plateau. British builders have supplied and are supplying electric

locomotives to the R.E.N.F.E. Most Spanish trunk lines are single, and much can be done to increase capacity by modern signalling. There seems to be ample scope for C.T.C. A great deal of signalling equipment has been provided by British suppliers. If the financial resources can be made available, the Spanish railways should be able to maintain and strengthen their links with British industry, to the advantage of both.

### Equality of Opportunity on East African Railways

THE opportunities, irrespective of race, of a career on East African Railways & Harbours, are made clear in a booklet we have received from the E.A.R. & H. Administration. It has been issued mainly for distribution in the three territories served by the railway. The facts are stated with scrupulous fairness. Intending applicants need be in no doubt of the qualifications required for acceptance as a trainee in one of the several grades. To be accepted as a Cadet, in the grade intended for training men for assistant officer posts, the candidate must possess "an appropriate honours degree from an approved university or a Makerere College [Uganda] degree of the prescribed standard"—or in the case of the Engineering and Mechanical Departments, an engineering qualification acceptable to the appropriate Chartered Institution. The foreword points out that the salary structure of the Administration is non-racial, "and equal opportunities for advancement are open to all." Nevertheless, whilst the policy is to recruit the bulk of E.A.R. & H. staff from within East Africa, "with the current shortage of manpower in the skilled and professional occupations, the recruitment of some trained staff from overseas continues to be necessary for the present."

### Improving Rhodesian Rail Outlets

UNTIL the opening of the new South-East Railway to Lourenço Marques on August 1, 1955, traffic from and to the Rhodesias via the port of Beira was so heavy that it was necessary to phase shipping imports in order to keep within the capacity of the port and the single-line railway linking it to Umtali in Southern Rhodesia. The opening of the new line has made it possible to divert traffic to Lourenço Marques, but there are signs that traffic through Beira is continuing to grow. Two new wharves are being built, increasing the number from six to eight, and it is believed locally that within five years traffic will have expanded to such an extent that a double-track railway will be essential. The line was built originally to the 2-ft. gauge and was converted to 3 ft. 6 in. in 1900. Draining and ballasting have always required careful attention because of the heavy rainfall—as much as 43 in. in nine days—and to build a second track would be costly, particularly west of Dondo, where many waterways must be provided to allow for flood conditions. It is understood, however, that the Portuguese authorities have decided to go ahead with the doubling of the track between Beira and Dondo Junction, a distance of some 18 miles over which the Trans-Zambesia Railway also has running powers. No doubt other work on the line will be undertaken as traffic grows.

### European Summer Passenger Services, 1958

LECTRIFICATION works which will be in progress next summer seem to have been an obstacle to acceleration to passenger services on the Continent. The main decisions of the recent annual European Timetable & Through Carriage Conference as now advised to us, and as they affect services to and from Britain, are disappointing; they are summarised on another page. The conference was held in Naples, at the invitation of the Italian State Railways. Next year's meeting is to be held in Leipzig, where the host administration will be the State Railway of the German Democratic Republic (Eastern Germany); two other conferences have been held behind the Iron Curtain, at Cracow, in 1948 and Budapest in 1954. Important decisions this year relate to the acceleration

of the "Rheingold" between the Hook of Holland and Basle, and a new "car/sleeper" express between Ostend (in connection with the Dover steamers) and Milan via the Gotthard. The French National Railways unfortunately seem unwilling appreciably to accelerate their Paris-Calais boat trains. All things considered, the "Golden Arrow" in both directions remains the slowest major day express in France.

### Serving Bristol Traders

A N example of the efforts being made by British Railways to capture freight traffic is a booklet issued by the Western Region, "British Railways at Your Service in Bristol." Some 2,000 copies are being circulated to traders in the Bristol district. The 16 pages include a list of the depots serving the area, with particulars of their respective functions and ready reference to the telephone numbers of the various railway freight offices available to the public. Facilities such as road/rail containers, Collico collapsible cases, railhead depots, private sidings, and cartage arrangements are fully explained. Transit times are listed between Bristol and principal centres throughout the country. Among some 64 places named, there is "second-day" (against "next-day") arrival of wagons at only seven, including Glasgow, Hull, and Preston. Attention is drawn to the possible delays caused by the closure of firms' premises on Saturdays. The references to facilities for export traffic, Continental services, and credit arrangements are clear and concise. The opportunity is taken to remind traders of the passenger services available for works and office outings, and other party travel, and the cheap fares and other individual travel facilities. The Region should be congratulated on some useful public relations work.

### Explaining the Reason Why

UNPUNCTUALITY loses railways more goodwill than any other cause for complaint in passenger business. Annoyance is aggravated by the frequent failure to explain delays. A good deal of unpunctuality is inevitable, and it may not always be possible—though it usually is—to let passengers know why their train is running late. The problem is being attacked boldly by the Southern Region. Work in conjunction with the electrification of the Kent Coast line, more particularly the widenings between Bickley Junction and Swanley and between Rainham and Newington, has been causing unavoidable lateness. The Public Relations Officer arranged for distribution last Monday of a leaflet to passengers by morning business trains from stations east of Gillingham, on the section of line that is being electrified. With the title "The Truth About the Kent Coast Line," the leaflet explains clearly the nature of the major works in progress ("the biggest thing that's happened on the Southern for twenty years"), and shows that delay is bound to occur before the benefits of electrification can be realised. There is an outline diagram of the Bickley Junction to Swanley widening. By all accounts, this approach has been well received by the public. It could be extended with advantage to other sections of British Railways.

### Studying Signalling Possibilities

QUEST of honour at last week's annual dinner of the Institute of Signal Engineers, Mr. R. F. Hanks has found time since his appointment as Chairman of the Western Area Board, to study amid his other responsibilities various aspects of railway activity. In his speech last Friday he urged that greater consideration be given to improving signalling, with the techniques available today, to increase line capacity, as for instance in two-way working. Much thought has been given to this by British operating and signal officers; but a steady flow of traffic both ways throughout the day has made it unsuitable for many lines in this country, though several sections are now being adapted. Mr. Hanks' advice is not

untimely. There is a pardonable tendency to hesitate in adopting relatively untried techniques, more especially under the great burden of work thrust on signal engineers by modernisation plans, and with the shortage of trained staff; but these and other possibilities should be constantly studied afresh. The Western Region was also represented on this pleasant occasion by Mr. A. W. Woodbridge, its Signal Engineer, who is President of the Institute.

### Technology for Non-Engineers

THE advantages of the general public having a wider general understanding of technology than at present, to achieve greater collaboration and understanding between people in all walks of life, particularly as between engineers and non-engineers, were stressed by Sir George H. Nelson, in his recent Presidential address to the Institution of Mechanical Engineers. He attaches great importance to the need to recruit and train enough technologists to meet the ever-increasing demands on engineering, and he appeals for the more efficient use of the technical manpower of this country. On technical education for those who are not technologists, he maintains that it is necessary nowadays for those in responsible positions to have a wider knowledge than can be obtained solely from the arts and humanities, and that it is important that administrators should have at least a minimum of technical training. After considering the fewer engineering graduates in this country in relation to the size of population compared with the U.S.A. and U.S.S.R., he suggests that more thought should be given to employing women in engineering, more particularly for developing the equivalent of the shorthand-typist or secretary, to assist senior engineers and relieve them for more important work; this is a constructive, interesting suggestion that might well be considered in the light of the acute shortage of trained engineers in the railway industry.

### The Cost of Competitive Tendering

SIR GEORGE NELSON also points out what he believes to be the comparative inefficiency associated with tendering for great engineering projects; the cost of tendering in the case of a large company may be £20,000-£30,000, and of which only 10 per cent may result in orders. Although this problem is so beset with political considerations, he feels it incumbent on all professional engineers to see that it is thoroughly studied by public authorities for instance, with a view to eliminating this waste. Although any reduction of wastage is to be welcomed, his suggestion seems a dangerous one, which might lead to worse evils than those it is intended to cure. In view of the interest which was aroused recently by the report of the British Transport Commission on the question of purchasing procedure, and the strong feelings expressed in the Press in favour of competitive tendering in this country, it seems unlikely that an investigation such as he proposes, even if approved by the Institution, would result in many constructive suggestions. By and large, it is hard to see what better means can be adopted to ensure the lowest possible prices other than competitive tendering, costly though it may be to those submitting bids.

### Machine Tools for Railway Engineering

A CLOSE association has been maintained between railway engineers and the firm of Craven Bros. (Manchester) Limited, for many years, in connection with the supply of machine tools. This was emphasised, for example by the official visit by the Institute of Locomotive Engineers, last May, to the company's Vauxhall Works at Reddish, which was a feature of the summer meeting of the Institution. Among the Company's range of machine tools inspected on that occasion was a new axle journal turning and burnishing lathe, which incorporates some interesting features. These include dual drive by two synchronised electric motors and hydraulic loading of twin driving plates engaging both ends of the axle, enabling the machine to be equally suitable for machining new axles or reconditioning used axles with their wheels in position. Another recent design for railway engineering is a three-fixed-spindle

trepanning and drilling machine for wheels up to 3 ft. 7 in. dia. Both these machines are described in an article elsewhere in this issue.

### Brush Diesels for Eastern Region

THE first type "B" main-line diesel-electric locomotives for use on British Railways, Eastern Region, was formally handed over yesterday. As reported last week, this is a 1,250-h.p. mixed-traffic locomotive built by Brush Traction Limited at its Loughborough works; it is described briefly on another page. It is also the first locomotive to be completed for British Railways by the company, a subsidiary of the Brush Group, formed in 1955. The occasion marks the beginning of delivery of the 86 type "B" diesels ordered under the modernisation plan in the autumn of 1955. Apart from Brush Traction, the type "B" units were then ordered from four other manufacturers, English Electric, Birmingham Carriage & Wagon, North British, and Metrovick, and it is to be expected that deliveries from all manufacturers will be made in increasing numbers in the future. British Railways workshops are also responsible for the mechanical parts of a further 10 type "B" locomotives intended for service in the London Midland Region; these have transmission equipments supplied by B.T.H., and incorporate Sulzer 1,160-h.p. engines. It is understood that the first of these is likely to be completed shortly. The arrival of this type is keenly awaited to see which mechanical design features have been favoured by British Railways for locomotives of this size and type.

### The True Railway Student

ALL who are engaged in railway work or are interested in railways are potential railway students, and, if they are to make any contribution over and above their routine duties, must in some degree come within that description. This is the view expressed by Mr. A. H. Grainger, Deputy Chairman, London Transport, in his Presidential address to the Railway Students' Association last week. To be a student in the true sense of the word, he declares, there must be a sense of responsibility, a pride in the job, and an inquisitive and informed mind.

After a brief but penetrating survey of the history of railways in Britain, he concludes that although many railway companies were promoted to meet a real traffic need, far too many were formed, or sought to be formed, which were nothing more than financial adventures. The railway companies dissipated too much money in preventing, or seeking to prevent, other companies being formed or existing companies from building railways, either from a reasoned appreciation that the traffic did not warrant the construction of another line, the clash of dominant personalities, or the necessity for self-preservation. The operation of competing lines, with the use of more rolling stock and equipment than the total traffic justified, was an important factor in preventing the building up of financial reserves to meet the cost of modernising the railways when the need arose. The construction of stations and other railway premises was often to a scale unwarranted by the purpose for which the building was erected. Many stations, especially in small towns and villages, were badly sited, largely because local land-owners wanted to keep the railways out of sight. Thus road competition in the latter part of the period between the wars was directed against the railway undertakings suffering from lack of maintenance, with, in many cases, badly-sited stations and expensive branch lines to maintain, and with small financial resources. There was no effective selling organisation for the industry as a whole because the railways were competing not only with road transport, but also with each other.

The failure of the railways to meet the challenge of changing times, Mr. Grainger considers, was basically the result of the complete lack of co-ordinated planning in the first instance, but the railways, if the war had not started in 1939, would have had to carry out drastic changes to ensure their economic survival, if not, in some

cases, their physical continuance. At the present time the railways in their new form are seeking the same goal. As to nationalisation, he believes very strongly that "those of us who are in railway service have a clear duty to make the best contribution we can to the success of the industry we are in, or else get out." It is often stated that all the faults and failures of railways are caused, or aggravated, by nationalisation, and the very opposite is heard equally often. He makes a determined plea for all concerned to be practical. There had to be a large-scale railway reorganisation and it came about through nationalisation. Controversy should be forgotten. Success depends on all those engaged in railway work believing in railways and making the best contribution they can. The railways must now be given time to improve their organisation and prepare to meet the changed circumstances of today and the demands of tomorrow. This entails an opportunity, free from political interference, of devoting all energies to the provision of a modern and successful system of railways.

The problem today is not to secure the elimination of any form of transport, but to see that each plays its part in the general pattern. No one form of transport must seek to overplay its part. Road transport suffers from insufficient roads and lack of road improvements. No construction of new roads, however, no scheme of road improvements, would enable road transport to carry physically, or economically, all the traffic carried by the railways. More and more large cities are turning to underground railways for passenger transport. Such railways afford the only practical means of transport for large numbers of people to and from their work.

A warning by Mr. Grainger against the error of producing too many specialists deserves careful attention. Specialists are, of course, needed, especially in large organisations such as railways, but, as he emphasises, it is essential that there should be enough men who have a general knowledge and experience of the railway industry and are able to appreciate customers' needs and points of view. This wide grasp of transport knowledge is particularly important at managerial levels, and, to carry Mr. Grainger's point a little further, it should be recognised that a general transport qualification, such as those of the Institute of Transport, carries equal weight with those of the older specialised institutions. This view is gradually gaining ground as more men who have passed through all grades of the Institute are appointed to high transport positions. Another point which he stresses is that the way to promotion must be open for all who have the capacity—not only from fairness to the men concerned but also because the industry needs men of ability.

Railways have a service to sell. This service will improve in quality as modernisation proceeds. They also have customer resistance to overcome and public confidence to secure and maintain. To the railway student, in the broad sense in which Mr. Grainger defines him, the problem is a vital and stimulating challenge, a heavy responsibility, and a wonderful opportunity.

### British Timken and Automation

MUCH is made today of the threat of automation to good relations between staff and management. Fears are often expressed that the introduction of "thinking machines" will destroy existent good feeling and tip the balance against management where the situation is uneasy. It is therefore refreshing and very interesting to visit a works where full automation has been introduced and where staff in every grade, already content with working on a non- or only partly-automated assembly line, have made the changeover not only without regret but actually with enthusiasm.

The new automated factory at Duston of British Timken Limited is an example of this process. When questioned, operators expressed satisfaction with the new machines for reasons ranging from the personal ("I don't have to work weekends now") to the technical ("It's a great achievement—our output is enormously increased").

Constant attention continues to be paid to the human element: personnel of all grades are made familiar with every section and thus able to circulate from one process to another. This practice counteracts possible boredom arising through the performance of repetitive work and maintains human dignity and pride of achievement in the work.

One of the strongest impressions to be gained while touring a Timken factory is that of unshakable individual belief in the direct and personal interest of top management. There is no doubt that the great emphasis placed by the company's Chairman & Managing Director, Sir John Pascoe, and his executives on personal achievement in work and social life is responsible for this. The interest in and encouragement of sport has fostered a genuine team spirit, and it is no exaggeration to describe the whole payroll of British Timken as "one big family." Although individuals are encouraged to follow natural talents in their spare time—and sometimes at the company's expense—the result of such personal interest is not individualistic.

A conversation was overheard at the Duston factory during which a Timken employee claimed that a County cricket team was mostly composed of Timken personnel—"we could form an entirely Timken County team, and it would be a good one." Here, the emphasis has developed through the individual to the group.

The present production rate of the new factory averages some three million bearings a year of sizes between 1½ in. and 3 in. outside diameter, and it is planned to increase the annual production rate as required to a figure of five million. The speed of increase is dependent on market demand and to a large extent governed by the degree of standardisation existent in this country. At present this is at a low level.

Similar factors will necessarily affect the output of another new factory now in building at Daventry where larger assemblies, including bearings for use in railway equipment, will be manufactured. This factory is due for completion in about nine months' time.

The layout, manufacture, and design of the greater proportion of the machines used in the new Duston factory is American, although there is a growing percentage of British-designed and built machines, including examples from Wickman, English Electric, and from British Timken itself.

In the last connection, British Timken has been greatly assisted by joint use with the Timken Roller Bearing Company of Canton, Ohio, U.S.A., of the trademark "TIMKEN"; a practice which ensures the similarity of the finished products of both companies. Co-operation is also fully acknowledged with Tube Investments Limited. That company makes the hot rolled tubes of special nickel alloy steel used in the manufacture of Timken tapered roller bearings in the Duston factory. The high-quality rolling of Assel Mill tubing and subsequent careful metallurgical control have made possible successful application of carbide tooling to automatic lathes.

A factor not yet referred to in connection with the building of these new Timken lines is the acquisition of new operating and maintenance knowledge. Arising from the requirements of the new factory, a team of engineers and production personnel has become established. This team is well apprenticed and experienced in dealing with problems inherent in this type of manufacture. It has designed mechanical handling systems and special machine tools, developed methods, and trained operating and maintenance personnel to use and look after the new equipment. Many of the new techniques have found application in the general factory machine shop. British Timken intends to make the maximum use of them in accepting the challenge augured by the European Free Trade Area.

From this brief survey of British Timken achievement through wise application of automation, it is evident that British industry as a whole (both from the viewpoint of management and work-people) has much to learn and to gain from what in any event would appear to be an inevitable development.

### Use of Motive Power

THE setting-up of a small permanent inter-Regional organisation to assist in co-ordinating locomotive and enginemen's workings, and in arranging through workings and balanced returns for special traffics as and when they arise, is one of the suggestions put forward by Mr. A. S. Gillitt, Assistant, Office of the Motive Power Superintendent, London Midland Region, in an article on motive power in the August issue of *British Transport Review*. This is the ninth contribution to the series "Towards Fuller Employment." Other articles in the series have been discussed in our editorial columns from time to time.

For some time now considerable progress has been made towards achieving higher availability of locomotives. One of the most promising methods is by reduction in time spent on servicing between trips, maintenance in depots, and repairs in main works. Such features as self-cleaning smokeboxes, rocker grates, and hopper ash-pans are now incorporated in British Railways designs for steam locomotives, and in the London Midland Region 631 locomotives, or 11 per cent of the stock, are fitted with these items.

The savings in time and cost—particularly where disposal duties are carried out by enginemen—which these features make possible suggest that there is much wider scope for their use, especially as the quality of coal deteriorates. If only half the 631 locomotives mentioned were dealt with by enginemen, and if disposal time could be reduced by only 15 min., some 35,000 more engine-crew hours a year would be available for productive work outside shed limits.

Extending this principle to the whole of the steam locomotive stock of British Railways, some 2,000,000 more engine-crew hours a year could be made available. If preparation and disposal duties could be taken entirely from the hands of engine crews it would be possible to employ them almost exclusively on productive work outside shed limits. This would be of great assistance in planning better diagrams for locomotives and crews and would reduce time spent by enginemen in travelling as passengers. Steam locomotive preparation and disposal, he suggests, could be equally well and more economically performed, possibly at incentive bonus rates, by semi-skilled artisan and shed staff, certain of whom could be passed for moving locomotives on the shed—the principle of main-line diesel locomotives being prepared by artisan staff, he states, is already established. If this could be done, some 250,000 more engine-crew hours would be made available for allocation to productive work each week.

Time spent in sheds by locomotives could be greatly reduced by the extension of the "uniflow" shed yard layout principle, introduced by the L.M.S.R. in 1933 and designed to ensure that all movements of a locomotive from entering a shed to reaching the road on which it is to be stabled until it is to leave again are made in one direction. By this system a locomotive can be completely disposed of and stabled within 1 hr., and fewer staff are required. An important factor in increasing availability has been the "X" scheme, the object of which is to give each locomotive a definite period on the shed at regular intervals, during which the maximum amount of repair work, including all scheduled periodical and mileage examinations, can be carried out. The period between "X" days varies according to the type of locomotive but is always a multiple of the interval between washings-out of the boiler, so that the operations can coincide.

A useful indication of the success of the scheme is the figure of miles run per mechanical casualty, which has risen from 20,687 in 1950 to 44,906 in 1956, with a sharp jump from 31,534 in 1953, in October of which year a new procedure was introduced, to 40,490 in 1954. The present target aimed at is that not more than 15 per cent of the operating stock of locomotives should be out of traffic at any one time, the ultimate aim being 10 per

cent. The 15 per cent is made up of 4 per cent in and waiting snops, 2 per cent waiting material at sheds, 5 per cent under repair or examination at sheds for 24 hr., and 4 per cent available by 6 p.m. after repairs or examination at sheds. An increase of 1 per cent in availability would release 176 more locomotives for traffic at any given time.

The main limitation to efficient diagramming of locomotives and enginemen is the timetable itself, and Mr. Gillitt suggests that, as examples have already shown, there is no need to wait for main-line electrification before the timetable can be recast. The disparity between the running times and punctuality of passenger and freight trains restricts the use of mixed passenger and freight diagrams and the full employment of many mixed-traffic locomotives. Another factor is the limitation on the length of runs caused by the need for fairly frequent fire-cleaning and coaling.

Main line diesel locomotives can remain in traffic as long as their fuel lasts—usually 600-800 miles—but require examination over a pit once every 24 hr. This need not be at a shed, and shed attention should be needed only every 5,000-6,000 miles. The main-line diesels Nos. 10201/2 and 10000/1 working in tandem, have been running between London and Glasgow and back daily, covering 800 miles a day for six days a week. The longest steam locomotive workings at present in use are some 600 miles a day.

To obtain the maximum saving from diesel working it is necessary to convert a whole area, but steam facilities cannot be abandoned while steam locomotives are performing through workings. These through workings must therefore be converted to diesel traction first. Diesel locomotives must work right through wherever traffic flows exist, regardless of Regional boundaries. The introduction of multiple-unit diesel trains creates certain problems. If there are enough trains to meet peak suburban demands, some must lie idle during much of the day. If diesel locomotives were used to augment services during the peaks, they could be used for freight services at other times.

The steam locomotive problems to which Mr. Gillitt draws attention will solve themselves in time as the stock of such locomotives falls. There may therefore be a tendency to concentrate on the admittedly more exciting diesel and electric services being introduced. Nevertheless, the possible savings in steam costs are worthy of attention, and the sooner improvements can be made the greater the economies that should result.

### Low-Grade Fuel for Diesels

THE problem of improving performance with low-grade fuel oil is being examined by the Canadian Pacific Railway. For over three months a 1,500-h.p. diesel locomotive has been in freight service between Montreal and Toronto, using regular diesel fuel along with a low-grade, tar-like, petroleum product. This is the first time that the C.P.R., which has benefited from diesel power since 1943, has used low-grade fuel in a diesel locomotive in regular service. An underlying consideration has been that international unrest, threat of war, or events such as the Suez Crisis might result in the C.P.R., with other North American railways, being compelled to use low-grade residual type blends of oil. Steps are being taken to find the most economic type of fuel available because of the present high consumption of oil. If the decision is made to use heavy fuel, dual fuel selectors will be put into service generally on all diesel units.

The unit now undergoing tests is designed with a view to burning heavy fuel 80 per cent of the time. It has been fitted with a dual fuel selector panel which automatically changes the type of fuel according to the throttle position. It is equipped with two tanks, one containing 500 gal. of regular diesel fuel and one carrying 1,000 gal. of heavy fuel. The dual fuel system installed in the locomotive is composed of essentially eight component parts: fuel injector gear pump and motor, injector heater, circulating

gear pump, and motor and suction strainers. The selector panel is some 5 ft. high, 4 ft. wide, and 1½ ft. deep. It is fitted at one end of the locomotive and occupies the space of the steam generators used on diesels to heat passenger coaches.

The selector enables the automatic switching over from standard fuel when the throttle is in fifth position to the heavy fuel. Residual fuel is fed into the injectors after the throttle has been in the fifth position for 50 sec. and has been burning regular fuel previously. Regular fuel is fed into the injectors when the throttle has been in fifth position for 90 sec. and has been burning residual fuel. The heavy fuel is not burned when the diesel unit is idling.

Residual blend fuel, with viscosity at 100° F., of 300 SSU, is the type of low grade fuel burned. The viscosity is improved by heat derived from the cooling water of the engine of the diesel unit so that the fuel when entering the injectors has a viscosity at 160° F., of 70 SSU. This enables the injectors to vaporise the fuel. Fifty locomotives of the Southern Pacific Lines which have been fitted out with this fuel system have produced results showing that the use of heavy fuel did not interfere with regular shopping procedures.

Residual fuel is about 2 cents a gal. cheaper than the standard fuel now in use in the Montreal district. This could mean great economies to the railway, which uses 100,000,000 gal. of fuel oil annually. Predictions place the C.P.R. fuel consumption at twice its present level when the process of conversion to diesel traction is completed in 1961. Mr. N. R. Crump, President of the C.P.R., stated in his annual address to shareholders in 1955 that virtually complete conversion of the motive power to diesel was envisaged by 1961. To carry out this programme and to provide the subsequent additions required for replacement and expansion over the remainder of the 15-year period would require the purchase of about 680 diesel units at a total cost of some \$125,000,000. This gives some indications of the potential savings that might result from the use of a lower grade fuel, provided that any increase in maintenance costs does not prove excessive.

So far there has been no reports of serious drawbacks. Many factors require continued and careful consideration. Fuel tanks on diesels will have to be insulated if this equipment is to be used, and additional storage space for the low grade fuel will have to be arranged. Tests are expected to continue for more than a year.

## Poor Outlook for Railway Freight Business

(By a correspondent)

So far as freight train traffic is concerned, No. 9 of *Transport Statistics* is a gloomy bulletin, though it covers the period from August 12 to September 8, when industrial output was estimated to be about 6 per cent higher than a year earlier. There was a boom in motor manufacturing, while steel output was up 9 per cent and 11 per cent more cotton yarn was produced. The tonnage of mined coal was slightly above last year's level and nearly 1½ million more tons of opencast coal were won. Yet for the first time since 1948, British Railways originated in Period 9 less than 20 million tons of goods and minerals. The exact quantity of 19,729,000 tons was 361,000, or 1.8 per cent, less than in 1956 and 1,980,000 tons, or 9 per cent, below 1951 forwardings. The drop in tonnage meant that the railways worked 1,477 million ton-miles in the four weeks to September 8. That was a decrease of 42 million, or 2.8 per cent, from 1956 and of 207 million, or 12 per cent, from 1951.

### FREIGHT OPERATING STATISTICS

The bulletin gives operating statistics for 12 weeks from June 17 to September 8, when 56,751,000 tons originated, a decrease of 1,235,000, or 2.1 per cent; ton miles declined at much the same rate, by nearly 96 million to 4,318.7 million. Wagon loadings (including free-hauled) numbered 6,434,000, a decrease of 175,000, or 2.7 per cent. Coal class loadings were 149,000 fewer, a fall of 5 per cent,

and mineral loadings were 11,000 less, or 1 per cent. The wagon load of coal at starting point was 12.7 tons and the mineral load 13.4 tons. Both figures represented an improvement of about 4 per cent on 1956 and set up new records. In contrast the average merchandise wagon carried a load of 3.89 tons. Neither the dispatch of many lightly loaded wagons nor the provision of fitted wagons on a liberal scale seem of any avail in keeping high-rated traffic to rail. On the contrary there is a risk of traders being annoyed at the increased cost of rail movement within their works, through the time spent in coupling and uncoupling fitted wagons which are not necessary for their traffic.

In handling the diminished traffic volume, British Railways worked 29,120,000 freight train miles, an increase of 199,000 (0.7 per cent). The Eastern Region accounted for 152,000 extra freight train-miles (2.7 per cent) though it worked 19,325,000 fewer ton-miles (2.2 per cent). The Region worked 11,000 more freight engine-hours (1.9 per cent), compared with a nominal all-line increase of 4,000 (0.1 per cent). The Eastern's steam freight train speed of 9.83 m.p.h. compared favourably with the all-line average of 9.52, but its electric freight train speed slipped back a third of a mile an hour to 10.14 m.p.h., when 27,000, or 9 per cent, more loaded train-miles fell to be worked. The Manchester-Sheffield-Wath lines were no doubt responsible for the retrogression.

On a general average, the trainload decreased from 153 tons to 148. The London Midland load of 172 tons was 2½ tons less, while the Eastern load dropped by 8 tons to 164. For the whole system, the hourly output of freight train operation, measured by net ton-miles moved in a train engine-hour, declined by 31 points, or 2.6 per cent, to 1,150. The L.M. Region output of 1,183 was almost unchanged, owing largely to a cut of 14,000 (1.5 per cent) in train-hours. Though producing 1,349 net ton-miles in a train-hour, the Eastern dropped 59 points (4 per cent) and the North Eastern figure of 1,257 was 47 points lower (3.5 per cent).

Wagon-miles tell the same story of lower output. The total for all Regions was 17,476,000 less than in 1956 (2.1 per cent). On an average 222 wagon-miles were worked in a train-hour against 227, the Regional averages varying from 198 in the Western to 232 in the North Eastern and 249 in the Eastern.

Enough has been said to show that the performance of our railways as freight carriers was decidedly poor during the third quarter of 1957. Judging by the advance statement of traffic receipts for four weeks to October 6, there is little prospect of an improvement in the position during the last quarter of the year.

### FREIGHT ROLLING STOCK

On September 8 the stock of freight wagons and brake vans was 1,100,189, about 23,850 less than a year earlier. The number of these vehicles under repair was 84,791, or 7.7 per cent of the stock, leaving 1,015,398 available for traffic, some 30,500 less than last year. The number of serviceable wagons should be adequate for the traffic now passing, but such a large accumulation of crippled wagons is bound to be a source of inconvenience.

During 12 weeks to September 8 the stock of locomotives of all types was reduced by 79 to 17,935. No less than 16.5 per cent, or 2,962, were under repair. Even for steam engines that is a high repair ratio, but perhaps it is more serious that the modern types of locomotive are not dependable. Of 118 diesel (mechanical and hydraulic) engines 12 were under repair, of 591 diesel electrics 70 were unserviceable, and of 71 electric locomotives eight were out of action. The situation is nearly as bad in regard to diesel multiple-unit passenger cars, though of a stock of 1,017, about 700 have been in service for less than a year. On September 8 the number of unserviceable carriages was 95, or 9 per cent of the stock. Both the experiments with diesel power and the electrification of the Manchester-Sheffield-Wath lines involved from their inception unexpectedly heavy maintenance costs in addition to large capital expenditure on new machines.

## THE SCRAP HEAP

### Steam to Diesel Changeover

The recent decision of the Steel Company of Wales to cease using steam power, in favour of diesel locomotives, at the Abbey Works, Port Talbot, was marked by a ceremony, as reported in our October 11 issue. The illustration shows the last steam locomotive to be used in the works, 0-4-0T No. 201, built by Barclay in 1901. It had just returned to the locomotive shed after its last duty. The driver then transferred to Brush 0-4-0 300-h.p. diesel locomotive No. 509, seen leaving the shed.

### Case for C.T.C.?

At a station on the Mombasa-Nairobi line of East African Railways, a pride of lions recently took possession of the track and kept the station staff away from the points. As a result, two passenger trains were held up for an hour until the lions wandered away and the staff were able to emerge from shelter.

### Early Railway Telegraphs

In 1837 Cooke and Wheatstone persuaded the directors of the London & Birmingham Railway, which was opened for traffic in the following year, to make a trial of the electric telegraph between Euston and Camden Town Stations. The trials proved successful. Between 1838 and 1843 the Great Western Railway board installed the electric telegraph from Paddington to Slough, and soon afterwards the new method of transmitting intelligence received considerable publicity. Its use led to the arrest of Tawell, the Salt Hill murderer, who had boarded the train at Slough, disguised as a Quaker and who was unaware of the fact that his description could be telegraphed ahead to Paddington. . . . By the middle of 1848 more than 1,800 miles of railway—half the mileage open for traffic at that date—were equipped with the new telegraph; and in 1854 eight out of the 17 London telegraph offices,



*The last steam locomotive to be used in the works of the Steel Division of the Steel Company of Wales; the diesel shown is taking over its duties*

all owned by private companies, were at railway stations.—*W. H. Chaloner in "The Manchester Guardian."*

### The Gentry's Railway

An Irish railway, the Castleblaney, Keady & Armagh, was planned in 1836 and only completed in 1909. It was one of the first local railways proposed in Ireland and was promoted by the landed gentry of Armagh and Monaghan. The original plans and sections are signed by William Bald, the Chief Engineer, and Hugh Hanna, of Belfast, who surveyed the proposed line, under the date December 12, 1836. H. T. Hope, of Castleblaney, the owner of the famous Hope Diamond, and other landowners were the promoters of the scheme. It was very unpopular with

the farmers, who called it "The Gentry's Railway."

After nearly 73 years' delay, the Castleblaney, Keady & Armagh Railway was opened from Armagh to Keady in July, 1909, and the extension to Castleblaney in December of that year. The undertaking was vested in the Great Northern Railway, with which it connected at Armagh and Castleblaney, in 1911. Part of the line was closed in 1924 and the track was lifted between Keady and Castleblaney in 1935. The remainder is abandoned.

### The Bluebell Line

[Further controversy over its closing.  
See also our July 12 issue]

Down in Sussex indignation  
Stirs the local population,  
Some of whom seem bent on kicking  
up a shine;  
For, although they seldom use it  
And continually abuse it,  
They object to being parted from  
The Bluebell Line.

Vainly harassed railway bosses,  
Pleading that they must cut their losses  
As the net receipts continue to decline,  
Say to users and non-users  
That, as beggars can't be choosers,  
They're fed up with losing money on  
The Bluebell Line.

If we cannot have perfection,  
It's a comforting reflection,  
As we look ahead to 1999,  
That, though railways may be missing,  
Men and maids will still be kissing  
And they'll still be picking flowers on  
The Bluebell Line.

A. B.

### Eastern Region Carriage Panels



*One of the six carriage panels by Rowland Emett intended for display in Eastern Region London suburban trains*

## OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

### SOUTH AFRICA

#### Doubling in Natal

The doubling of the Mooi River-Escourt section of the Natal main line was completed during September and opened to traffic on September 8. The route is now eight miles shorter with curvatures decreased by 4,000 deg. To bring the new section into use, Escourt station had to be re-modelled and the old single line platform demolished and replaced by two island platforms.

Work is well advanced on the last stage of the doubling between Pietermaritzburg and Ladysmith. This is the Cedara-Boughton section of 7½ miles involving the construction of twin tunnels, each 3½ miles long. Satisfactory progress is being made and the indications are that the section will be opened to traffic well before the scheduled date of late 1959.

The doubling of the main line between Pietermaritzburg and Ladysmith, a distance of 121 miles, together with re-grading and re-alignment, was one of the most expensive single works ever undertaken by the South African Railways. The latest estimated cost of the completed scheme is some £12,750,000.

### RHODESIA

#### New Head Office Building

A seven-storey railway head office is to be built in Metcalfe Square, Bulawayo. It will be some 150 ft. long and 60 ft. wide at ground level, and 90 ft.

high. Wing blocks will be added when future expansion is necessary.

The administrative block is to have a reinforced concrete frame with brick facing. The basement will have storage space for records, and the seven floors of offices will be divided into rooms by sound-proof metal partitions, an arrangement which allows any subsequent rearrangement of offices to be made without the need for structural alterations. Lift gear and water tanks will be concealed on the floor above the offices where additional storage space may be made available if required. The building has been designed by the Rhodesia Railways architect and construction will begin as soon as possible. The accepted tender calls for the new building to be completed within 20 months.

### NEW ZEALAND

#### Radiata Pine Sleepers

Investigations over 20 years are expected to culminate shortly when the Railways Department calls for tenders for the supply of 100,000 treated radiata pine sleepers. This will represent one-quarter of the number of sleepers the railways use each year. In the past, these have been hardwood sleepers imported from Australia.

Mr. W. K. M. O'Hara, Inspecting Engineer, Railways Department, states that the order is really a large-scale experiment, though the specifications of the sleepers have been the result of discussions between the timber industry,

the New Zealand Forest Service, and the railways.

In durability, treated radiata will outlast hardwoods, he maintains, but its spike-holding capacity is less than that of hardwood. It will not be possible to use dog spikes, and screw spikes will have to be used instead. The radiata sleepers should be cheaper than imported hardwood.

The management will call for radiata treated with pentachlorophenol and oil; with creosote and oil; and with creosote—in that order of preference. Consideration has been given to water-soluble preservatives; but those based on oil have proved more satisfactory. It will be about nine months before the sleepers are available and it is intended to use them on straight stretches of track, and not on curves.

### INDIA

#### Bombay Churchgate New Station

The new station at Bombay Churchgate, the terminus of the Western Railway electric suburban services, contains three tracks with platform faces on each side. The station building provides seven floors for additional office accommodation for the Western Railway.

The permanent signalling arrangements, which are also on the route relay interlocking principle, cover the signalling necessary for 23 routes. The apparatus includes 857 relays, 16 main signals, 7 shunt signals, 26 point machines, 30 track circuits, and about 7 miles of signalling cable.

### CANADA

#### C.N.R. Branch Line Opened

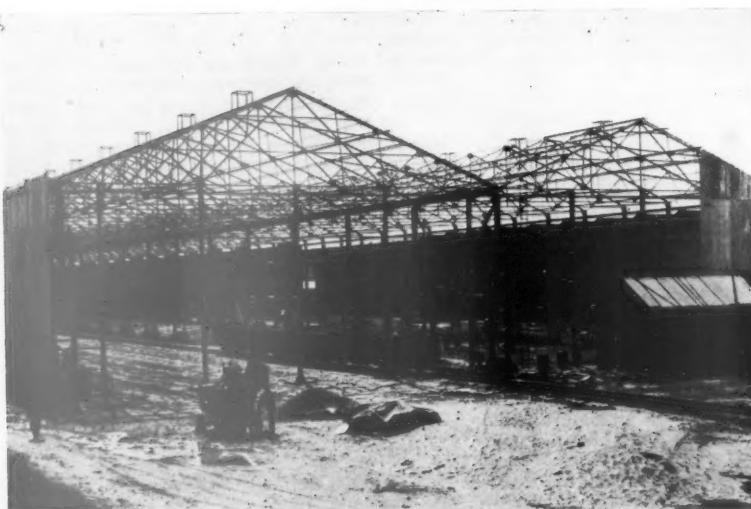
A regular train service over the newly completed Canadian National Railways branch line between Beattyville and Chibougamau began on October 7. Freight trains which now operate between Senneterre and Beattyville on a tri-weekly basis will continue on to Miquelon, 108 miles from Senneterre, and connection will be made there with another tri-weekly train running a further 107 miles to Chibougamau. Passengers will also be accommodated in these trains.

### UNITED STATES

#### "Twentieth Century Limited"

The falling-off in passenger traffic is shown by the fate of the famous "Twentieth Century Limited" during some months of the past summer. Since its inauguration in 1902, this has always been regarded as one of the most exclusive, if not the most exclusive, train in the U.S.A. It was always restricted to first class passengers, and in later years composed en-

#### New Wagon Shop for Rhodesia Railways



Wagon shop under construction at Bulawayo, part of the extension of the mechanical workshops

tirely of single-room sleeping, lounge, restaurant, and observation cars; it carried a large staff; and it commanded a substantial service charge in addition to first class fare and Pullman supplement. Recently reduction in patronage has caused the withdrawal of the "Commodore Vanderbilt" between New York and Chicago, and the incorporation of its "coaches" in the "Twentieth Century" formation. Never before has the latter been called on to carry what are in effect second class passengers; this addition also has resulted in the abolition of the service charge and some reduction in the train staff.

## ARGENTINA

### Centenary Celebrations

The centenary of the Argentine Railways was recently celebrated in Buenos Ayres and other cities. Apart from the ninth Pan American Railway Congress and the international railway exhibition, timed to coincide with the anniversary, it was commemorated in many other ways. Allegorical stands and displays were erected in all the terminals; a monolith was unveiled on the site of the original Parque Station; special films were shown in the cinemas; commemorative stamps were issued by the Post Office; and lectures and other functions were given in universities, clubs, and societies. By far the most interesting and picturesque part of the programme was the trip made by *La Porteña*, the first locomotive to run in Argentina, from Liniers to Once under its own steam and hauling one of the

two original coaches and a replica of the second. It had been brought from the museum in Luján to the railway shops at Liniers where it was overhauled and tested; and on August 30, driven by the oldest driver in service, it made the journey to Once. At the end of the trip it was received by the Minister of Transport, Rear Admiral Sadi Bonnet and other high officials, who, in short speeches, stressed the importance of the occasion.

In Rosario, a train whose locomotive and coaches were 70 years old, made a short trip driven by driver Juan Peressini, 92 years of age and pensioned 35 years ago. A similar train was exhibited by the General Roca Railway in Plaza Constitución and La Plata.

## ITALY

### Modernisation in Sardinia

Steam haulage on lines in Sardinia is being replaced by diesel-railcars for passenger and locomotives for freight trains. Much of the track is being relaid with heavier rails. Certain train services have been replaced by road services operated by the two railway companies on the island. A number of passenger trains are now being run as mixed trains.

In connection with the standard-gauge train lines between the port of Olbia and Cagliari and Sassari, a train ferry is planned between Olbia and Civitavecchia on the mainland. The distance by sea is 145 miles, at present traversed in 8 hr. by night by the mail ships (motor vessels). Three ferry-

## Publications Received

*Jahrbuch des Eisenbahnwesens (Railway Year Book)*, 1957. Published by Carl Röhrig Verlag, Darmstadt, 11½ in. by 8 in. 226 pages. Fully illustrated. Price DM 8.50.—This is the eighth number of this ably edited annual and as well produced as its predecessors. It includes articles on container traffic; the electrical operation on the Austrian Federal Railways, modern designs of electric motor coaches and railcars; the relations between the railways and the public; the "Trans-Europe Expresses"; the problem of rail corrugation; the history of mechanical and power interlocking frames and associated apparatus; and on the study of economics as applied to railways; also a list of mileages, electrified sections, traffic and operating statistics, and so on, covering all countries.

*International Carriage of Dangerous Goods*. London: Ministry of Transport & Civil Aviation (H.M. Stationery Office). 201 pp. 7s. 6d.—The "Regulations concerning the Substances and Articles not to be accepted for Carriage or to be accepted subject to certain Conditions (RID.)" are, in effect, an appendix to the Berne International Convention concerning the carriage of

goods by rail (C.I.M.). They have been published in English for the benefit of exporters of such goods to Continental countries, but, as is the case with other documents of this nature, French is the ruling language in the case of divergence. There are seven main classes, but some of these are subdivided so that the RID. covers in all 14 classes, including explosive substances; gases; substances liable to spontaneous combustion; inflammable liquids and solids; oxidising, poisonous, radioactive, and corrosive substances; and substances liable to cause infection. Each class is dealt with separately, information being given, inter alia, on conditions of packing, marking, labelling, method of despatch, and the type of transport equipment to be used.

*Fast Freight Trains for Traders in Scotland*.—The Scottish Region has produced an attractive series of handy-size booklets outlining the freight train facilities provided in each of its five main industrial areas: Glasgow, Edinburgh, Dundee, Aberdeen, and Kilmarnock. They have been published as a sales aid to stimulate the interest of transport managers and others engaged in the daily business of despatching traffic and as an easy reference to

boats, of a speed of 16 knots and a capacity of 20 wagons (or equivalent number of passenger vehicles), are reported to have been ordered. The National State Railways have been conducting trial sailings with ferryboats from the Straits of Messina service; the opportunity has been taken to convey new diesel railcars to Sardinia.

## FRANCE

### S.N.C.F. Traffic Increasing

Statistics recently published show that during the first six months of 1957 originating passengers on the S.N.C.F. numbered 27.9 millions and passenger-km. 14,800 millions in comparison with 26.2 millions and 13,400 millions respectively during the corresponding period of 1956.

On the freight side, some 107 million tonnes and 26,700 million tonne-km. moved during the January-June period this year, compare with 99 million and 24,700 million respectively in 1956.

### Ignitron Locomotives Performance

Earlier this year starting tests were carried out on the Brie to Audun-le-Roman section of line with BB ignitron-type electric locomotives. With an acceleration rate of 3 cm. per sec. per sec., starts were made on a 1 in 100 gradient with trains of 40 and 51 wagons, with a gross trailing load of 2,120 tonnes and 2,223 tonnes respectively. Subsequent tests with an acceleration rate of only 2 cm. per sec. per sec. enabled a start to be made on the same gradient with a train of 54 vehicles and a gross trailing weight of 2,424 tonnes.

the increasing number of fast freight train services now operated to a timetable comparable in reliability with passenger train services. In addition, the booklets summarise some of the varied facilities which British Railways provide.

*Design*.—The October issue of this monthly publication of the Council of Industrial Design includes a report on the British Railways Modern Travel Exhibition held at Battersea, London, last June. The comments on the various aspects of design seen in the exhibits, which included prototype coaches, diesel locomotives and multiple-unit trains are sweeping and of questionable accuracy. The Council considers that "few of the carriages on show attained a standard of design that the British Transport Commission would now consider remotely acceptable, and that in some coaches fundamental aspects of design such as correct seat dimensions, or the economics of operation in terms of seating density, had been given little serious consideration, while decorative treatments in a few instances revealed a retrogression from the standards already achieved in the days of the Railway Executive."

## First Type "B" Diesel-Electric Locomotive

*Brush-built 1,250-h.p. mixed-traffic unit for Eastern Region*



*Brush 1,250-h.p. diesel-electric locomotive for Eastern Region*

THE 1,250-h.p. AIA-AIA diesel-electric locomotive built by British Traction Limited, formally handed over to British Railways, yesterday (October 31), is the first of 20 such units ordered for the Eastern Region of British Railways to be delivered. It is also the first of the Type "B" (1,000-1,250 h.p.) units ordered in the autumn of 1955, as part of the British Railways modernisation scheme, to have been completed; the locomotives ordered at that time were detailed in our issue of November 25, 1955.

The locomotive, numbered D.5500, is also the first diesel-electric locomotive to be received by the Eastern Region. The 20 locomotives of this type, all of which will be allocated to the Eastern Region, will be employed on the former Great Eastern line at Stratford, London, working freight trains within the Region and also operating to and from the London, Tilbury & Southend section. Although the locomotives will be located at Stratford, they will be tried out in other areas of the Region as required.

### Delivery

Construction of other locomotives in the batch is well advanced and a production rate of one every three weeks is anticipated.

Two other companies of the Brush Group are responsible for major portions of the locomotives. Brush Electrical Engineering is supplying all the electrical equipment including generators, traction motors and control gear; Mirrless, Bickerton & Day are providing the diesel engines, while the erection of the locomotives is being undertaken at the Brush Traction Limited works at Loughborough.

The design of the 20 1,250-h.p.

Brush locomotives has been based on a batch of 25 5-ft. 6-in. gauge locomotives of similar power and wheel arrangement supplied by the Group to the Ceylon Government Railways around the beginning of 1953. These were referred to in our issue of November 28, 1952, and fully described in the January, 1953, issue of our associated publication *Diesel Railway Traction*.

The British Railways units, however, differ in detail design: for example, the cabs are full-fronted whereas the cab windows of the Ceylon locomotives were set back; also, bogies are steel castings compared with the fabricated method of construction of the previous units.

### Design and Styling

The locomotive has been designed and constructed to the general requirements of the British Transport Commission under the overall direction of the Chief Mechanical and Chief Electrical Engineers of the British Railways Central Staff. As the locomotives are intended for the Eastern Region, this Region became the sponsor Region for collaboration and inspection during the execution of the contract, under the direction of the Region's Chief Mechanical & Electrical Engineer. Although the basic design of locomotive was established at the time of ordering, considerable detail design work, to meet British Railways requirements for incorporating standard components and also to include new developments was necessary.

The consultant designers for the body, cab, and fittings were Messrs. Wilkes & Ashmore, on behalf of the Commission's design panel. Ease of

maintenance was held to be of prime importance and the design permits the speedy removal of body sides and roof for major overhaul of the equipment.

### Construction

In general the construction of underframe and body follows conventional methods incorporating rolled steel sections and sheet steel body panels. The bogies, however, are one-piece steel castings manufactured by the English Steel Corporation. Beyer, Peacock & Co. Ltd. were responsible for supplying the underframes and bogies.

Diesel power is from the well-known supercharged Mirrlees JVST12T, 12-cylinder Vee-type engine which develops the rated maximum of 1,250 h.p. at 850 r.p.m.; bore and stroke are 9½ in. and 10½ in. The engine is fitted with copper-lead main and big end bearings and the crankshaft has hardened main journals and crankpins. The engine is direct-coupled to the Brush single-bearing generator, an extension of the engine bed carrying the latter.

A maximum speed of 75 m.p.h. is intended and the units can be used on passenger service if required, as an oil-fired, train-heating boiler is fitted to each. They can be operated singly or in multiples of two or three units.

Leading design particulars are as follow:—

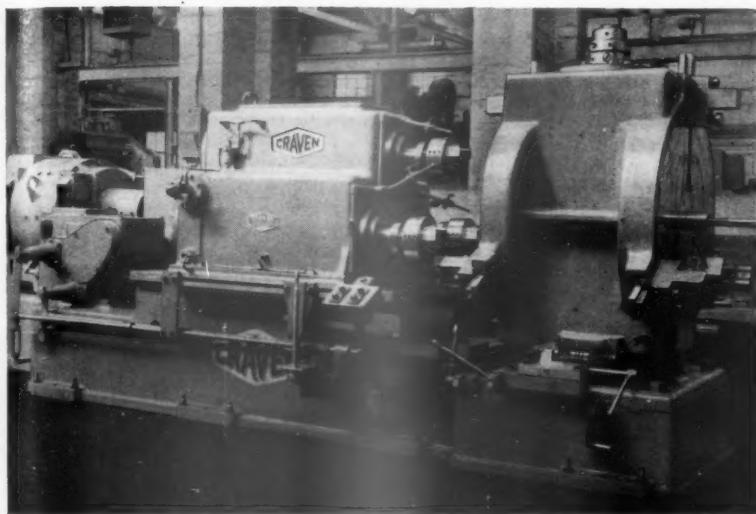
Length over buffers	56 ft. 9 in.
Maximum width	8 ft. 9 in.
Maximum height	12 ft. 7 in.
Bogie wheelbase	14 ft.
Bogie pivot centres	28 ft. 10 in.
Weight in working order	104 tons
Axle load on driving wheels	18 tons
Fuel tank capacity (main)	500 gal.
Fuel tank capacity (reserve)	50 gal.
Starting tractive effort	42,000 lb.
Continuous tractive effort at 16.5 m.p.h.	22,400 lb.
Maximum speed	75 m.p.h.

**DELAYS TO MAIL WAGONS AT EAST GERMAN FRONTIER.**—The authorities of the German Democratic Republic have been delaying railway mail wagons on the frontier station of Marienborn on their way from Berlin into the Federal Republic. More than 60 wagons have been detained in the last two weeks for periods of several hours and have shown signs of having been searched. There have been no delays to British and American military trains.

**STAGGERED SHOPPING HOURS IN LONDON PROPOSED.**—The committee on staggered hours set up some months ago by Mr. Harold Watkinson, Minister of Transport & Civil Aviation, is to ask the managements of West End stores to review the question of changing shopping hours. It is considered that this would be a major contribution to improving peak-hour travel, as almost half of the staff of these shops now leave work at 5.30 p.m. Attempts are to be made to persuade 60,000 more employees in Central London to stagger working hours in the coming winter. During the summer, 115 firms employing 18,000 people responded to the appeal and put staggered hours into operation.

## New Features on Craven Machine Tools

*High-speed axle journal lathe and three-spindle trepanning and drilling machine*



*Three-spindle trepanning machine for simultaneously machining three sprag holes in solid-disc wheels*

**T**WO machines designed specially for application in the field of railway engineering have recently been constructed by Craven Bros. (Manchester) Ltd. These are a high-speed 22-in. centres axle journal finish turning and burnishing lathe for use with carbide cutting tools, and a three-spindle wheel trepanning and drilling machine.

Suitable for machining the outside journals of carriage and wagon axles, either with or without their wheels in position, the axle journal lathe is of entirely new design and, being arranged exclusively for the use of cemented-

carbide cutting tools, is capable of giving a very high rate of production either in the manufacture of new axles or on the reconditioning of used axles. The maximum length of axle which can be admitted is 8 ft. 6 in., and the arrangement will accommodate wheels up to 3 ft. 6 in. dia. on the tread.

The axle to be turned and burnished is supported between spring-loaded centres and is driven simultaneously from both ends by the rotating spindles of left-hand and right-hand headstocks at either end of the machine bed, all

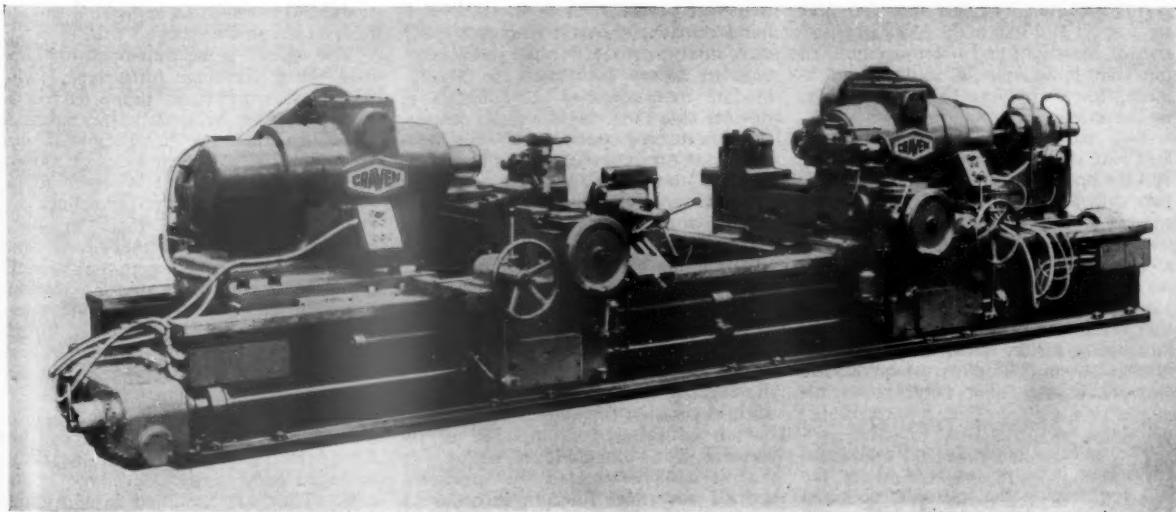
risk of twist in the workpiece being thus eliminated. The actual driving torque is transmitted directly to the two end faces of the axle by means of annular driving plates, fitted with knife-type driving dog inserts of hardened tool steel, secured and keyed to the nose ends of the two headstock spindles, around the two cone centres.

The end pressure required to cause the driving dogs to bite into the ends of the axle, and to transmit the full power of the two headstock drives, is applied by longitudinal movement of the right-hand headstock upon a sandwich plate base fitted to the main bed ways. The movement is operated by the ram of a hydraulic unit mounted on an extension of the sandwich plate and controlled by a lever positioned with a pressure gauge on the headstock. An electrically-interlocked safety device is fitted to control the driving motor in the case of failure in the hydraulic system.

Thrust from the hydraulic ram is imparted to the right-hand headstock in direct line with the spindle axis and is taken by a reinforced, dished spindle housing end cover. Hydraulic supply is from a motor-driven duplex oil pump unit from a reservoir tank formed in the body of the headstock sandwich plate. One pump delivers low pressure oil to operate the headstock into contact with the workpiece, after which the second pump supplies a high-pressure delivery to apply driving pressure.

### Dual Drive

Both headstocks have driving spindles running in tapered roller journal bearings, with large tapered roller thrust washers to take the heavy axial



*Craven axle lathe designed for the high-speed machining of axle journals*

driving pressure. Each spindle is driven by a separate 10/5 h.p. two-speed motor mounted on a baseplate attached to the body of the headstock. Vee-rope transmission is employed with worm reduction gearing, the two headstock motors being synchronised electrically. Spindle speeds of 300 and 150 r.p.m. are available for turning and burnishing operations.

The left-hand headstock has hand adjustment only on the bed for initial setting purposes, but the right-hand headstock, complete with its sandwich plate assembly, can be power-adjusted along the bed so that adjustments to suit varying axle lengths can be readily made.

Both headstock spindle noses are bored and arranged with hardened steel cylindrical sleeve members into

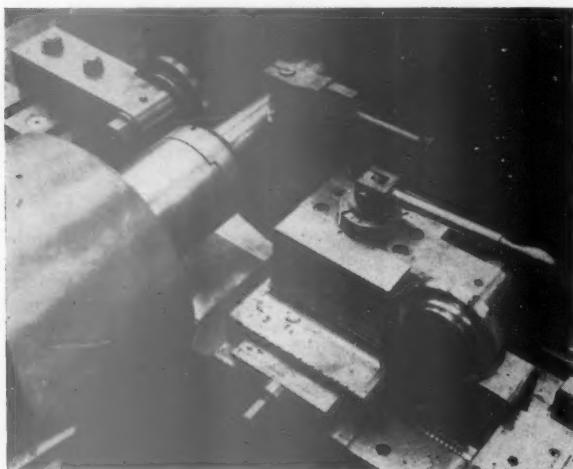
the front of the bed, and are fitted with automatic trips in both directions. The feed drive is obtained from a  $\frac{1}{2}$ -1 h.p. two-speed motor and worm reduction gear box, at the left-hand end of the machine, coupled to a feed shaft along the front of the bed. The gear box gives four separate rates of sliding feed, two fine feeds of 0.01 in. and 0.02 in. per rev. of the spindle for high-speed turning with carbide tools, and two coarser feeds of 0.04 in. and 0.08 in. per rev. for use when burnishing. Transverse surfacing feeds of half the above are available when facing the shoulders on the axles.

The two burnishing rollers, of hardened and polished high-carbon chrome steel, are mounted in their holders on anti-friction bearings. For burnishing, the front and rear rollers

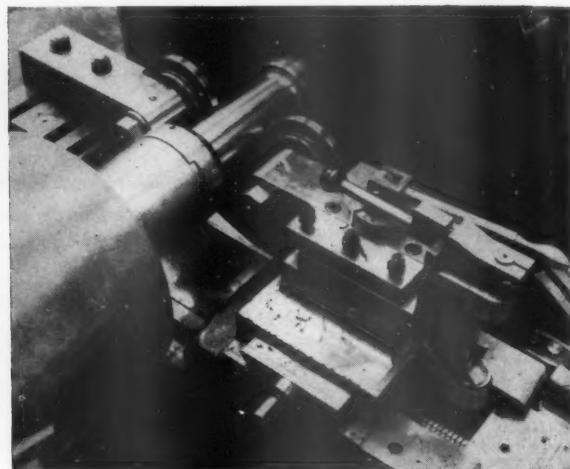
An electrically-driven wheel lift is built into the bed for raising the wheel sets up into line with the machine centres after being rolled into the machine on extensions of the workshop rail system. The lift is self-contained and is movable bodily upon rails in the bed of the machine in order to accommodate axles of varying length. A hand-operated brake is situated on the bed to bring the wheels quickly to rest after the motor stop button is depressed.

#### Trepanning Machine

The three-spindle wheel trepanning and drilling machine, recently delivered to Owen & Dyson Limited of Rotherham, is arranged for the rapid machining of large sprag holes in the webs of disc-type railway wheels. It is in some ways of similar construction to



*The fixed rear burnishing roller and combined turning/radius device used when turning*



*Front tool holder is revolved to bring both rollers into action for burnishing operation*

which the respective cone centres are fitted in such a manner that they may retract into the spindles against heavy spring loading. They are therefore able to support and locate the axles irrespective of the slight endwise movement of the right-hand spindle, and the workpiece, when applying the driving dogs to the axle end faces.

Two saddles, fitted with both front and rear tool rests, are provided on the bed for operation simultaneously on the two axle journals. Each front rest has a short non-swivelling type intermediate slide with longitudinal hand adjustment, and is equipped with a two-station revolving-type turret to carry a special combined turning and radius forming tool holder at one station and a front burnishing roller in its holder at the other station. The rear rest carries the rear burnishing roller only.

#### Automatic Trips

The saddles have the normal hand adjustment and power feed along the bed for turning the journals, obtained through revolving nuts in the aprons and a non-rotating lead screw along

are advanced inwards together to contact the workpiece and pressure is applied by the hand adjustment of the two rests through a right- and left-hand threaded transverse screw. Sufficient float is provided in the screw bearings to allow the rollers to accommodate themselves to the journals to obviate side thrust on the lathe centres.

When turning operations are required, the front turret is rotated to bring the turning tool into position, and the whole assembly, comprising the screw, bearing and the two tool rests, is moved forward bodily on the transverse slide to bring the tool into position and to move the rear burnishing roller clear away to the rear of the slide, the rests being automatically locked in this position during the turning operation.

The tool holder is arranged to enable the turning tool to be clamped in the normal position for cylindrical turning, but to be released at the end of its traverse by a toggle-lever action, so that it can be rotated by handlever around a vertical fulcrum in order to produce either hand of radius without recourse to separate form tools.

a number of more universal machines, with four adjustable spindles, previously supplied to the same company for this work, but is built to a somewhat simplified, fixed-spindle design.

The wheels to be trepanned are carried on a rotating, turret-type, two-positional work head supported on a pillar member accurately located and bolted to the right-hand end of the machine bed. Vertical faces on opposite sides of the turret are each fitted with a concentric three-jaw chuck to grip wheels up to 3 ft. 7 in. dia., enabling simultaneous machining and loading. After machining one wheel, the turret is rotated by motor power to bring the unmachined wheel into position. The turret is unlocked, lifted clear of its indexing keys, and relocked after rotation, by a pneumatic cylinder and eccentric clamping mechanism.

The three horizontal cutter spindles are of high-carbon steel and run in flood-lubricated anti-friction bearings arranged in separate sleeve-type housings. They are mounted in the main headstock at fixed centres, while the

*(Continued on page 512)*

## Rail Failures on British Railways

### Incidence, and preventive measures

By J. Dearden, M.Sc., F.I.M., A.M.I.Mech.E., Assistant Superintendent, Metallurgy Division

British Transport Commission (British Railways Division) Research Department, Derby

ALTHOUGH the removal of rails from the track is generally determined by their loss of section through wear and corrosion, this criterion is really a rough measure of their liability to failure. Rail failures therefore have an influence on the cost of maintaining the permanent way as well as on its security, so that there is a double incentive to reduce their incidence as much as possible.

Most rail failures have their origin in fatigue, a cumulative phenomenon arising from the repeated application of loads, so that the liability to failure is closely associated with period of service, annual traffic carried, axle load, speed and standard of track maintenance.

Loss of section through wear and corrosion causes a corresponding increase in rail stresses, but as this loss is less than proportional to annual traffic, liability to failure on busy routes is more likely to have its origin in accumulated fatigue than from weakness through loss in section. Fatigue occurs at positions of high stress such as bolt holes, corrosion pits, chair galls, fillets having inadequate radii, manufacturing defects, wheel burns, and so on, and becomes evident by the formation of a crack, the subsequent growth of which is greatly accelerated by corrosion, particularly in tunnels, on water troughs, and where rails are wetted by effluents from locomotives and trains. If the crack remains unobserved it will grow until a point is reached when the remainder of the section breaks suddenly in the form of a brittle fracture.

The first step towards obtaining a reduction in the annual number of rail failures is to record, count and analyse them in order to discover what are the most frequent types of causes of failure, and the conditions associated with them. After remedial measures have been taken, the annual analysis will show how effective they have been. As rails remain in main lines some 15-20 years, investigations of this kind are essentially long-term.

#### Handbook and Report Form

In order to unify the classification of rail failures and to establish a common system of reporting, a committee of railway engineers and metallurgists devised "Rail Failure Handbook" and a Rail Failure Report Form which were brought into use on British Railways in 1948.

The "Handbook" defines a failure as "every rail, including those in switch and crossing work, which has to be removed from a running line prematurely because of a break, crack or

defect." This wide definition includes a large number of failures which are not normally reportable to the Ministry of Transport, since the latter requires reports only in the case of plain rails in passenger lines which fail by breaking through the full section, or which have a piece broken out of the head and interrupting the running surface.

Twelve different types and seven causes of rail failure are recognised in the handbook, which contains photographs illustrating each type. A simple code is provided for the classification of failed rails according to whether they are broken, cracked or defective, i.e., either broken or cracked, and including the cause and type of failure.

The handbook serves as a guide for the filling-in by the permanent way inspector of the report form, which includes spaces for information about the location, track conditions, traffic, and the rail itself; provision is made on the reverse side for sketches showing the position and nature of the failure.

The object of this system of classification and reporting is to find out what are the most frequent types and causes of failure by means of annual summaries and analyses which enable the Chief Civil Engineers to compare line with line, year with year, to assess general tendencies, and to adopt remedial measures.

#### Rail Failure Analysis

A summary of failure types and causes has been prepared for 1949 and each subsequent year by the Metallurgy Division of the British Railways Research Department for all Regions of British Railways. The work has been facilitated and its scope extended by the use of Hollerith punched cards for 1952 and subsequent years.

The chronological course of the failure position is plotted in Fig. 1, which shows a steady decrease in the number of plain rail failures except for 1954 when there was a marked increase in the number of cracked rails, accompanied by a reduction in the number of broken rails. The increase in the number of cracked rails was to some extent due to a few local epidemics of cracking, mostly associated with the obsolete 113 lb. per yd. flat-bottom section and to certain water troughs.

Switch and crossing rails, however, have shown much smaller annual variations than plain rails, and their failures have generally been within the 350-400 range during the seven years involved.

The distribution of the failures according to type and cause is shown in Table 1 for the years 1952-53-54 taken together. During this period 88

TABLE 1: DISTRIBUTION OF FAILURES ACCORDING TO TYPE AND CAUSE

	Plain rails	Switch and crossing rails
Broken ..	44	54
Cracked ..	47	44
Defective ..	9	2
	100	100
<i>Failures within 2 ft. of the rail end:</i>		
Through bolt holes ..	28	4
Elsewhere ..	28	4
Total ..	56	8
<i>Failures elsewhere:</i>		
Transverse failures ..	19	48
Longitudinal splits ..	15	10
Through bolt holes ..	0.7	32
Other types ..	9.3	2
	100.0	100.0
<i>Cause:</i>		
Maintenance conditions ..	56	56
Inherent in the rail ..	22	12
Abnormal traffic effect ..	12.4	4.8
Special causes ..	6.5	3.1
Unknown causes ..	1.8	3.8
Welding ..	0.6	20.0
Corrosion ..	0.7	0.3
	100.0	100.0
<i>Type of rail:</i>		
Point ..	—	46
Wing ..	—	43
Stock ..	—	4.5
Splice ..	—	3.5
Switch ..	—	3
Serviceable ..	11	—
	—	100.0

per cent of the failures occurred on bull-head rails, the newer flat-bottom rails not having been in the track long enough or in sufficient quantities to contribute significantly to the total number.

TABLE 2: FAILURES DURING 1952, 1953, 1954, AND 1955 ON PLAIN RAILS LAID DURING 1950-55

Rail section	Number of plain rails laid	Number of failures
109 lb. F.B.	830,000	194
95 lb. B.H.	770,000	226

The summary in Table 1 was analysed in much greater detail, using the Hollerith punched cards to sort and tabulate various sections of the total population of rail failures. For instance, it was possible to provide early information regarding the performance of the recently-introduced British Railways 109 lb. per yd. flat-bottom rail section in comparison with British Standard 95 lb. per yd. bull-head rails of similar age. Switch and crossing rails were excluded from this comparison.

Despite the general practice of laying flat-bottom rather than bull-head rails on the busier routes, the former have given the better performance during these early years of their lives.

The comparison is even more favourable to the flat-bottom rails if failures in tunnels and on troughs are excluded.

In this restricted comparison, the bull-head rails were much more liable to transverse and rail end failures, while the flat-bottom rails were slightly more liable to longitudinal splits originating from defects in manufacture. The rails involved in these two samples are, however, still relatively young, and the comparison is being continued.

#### Process of Manufacture

About 75 per cent of the rail tonnage purchased by British Railways during 1950-55 was made by the basic open-hearth process, and the remainder by the acid Bessemer process. The Hollerith cards provided the opportunity of comparing the performance of rails of similar age made by these two processes, and the comparison was based on rails laid during 1950-55 and failing during 1953, 1954, and 1955. In order to eliminate any bias which might arise out of the possible existence of an undue proportion of rails of one kind in unfavourable locations, failures occurring in tunnels or on water troughs were excluded; but failures on switch and crossing rails were included, to keep the sample as large as possible.

The difference is less than that existing between the five manufacturers using the basic open hearth process; it should not be inferred that the acid Bessemer per se is a superior process for making rail steel, as the quality of the rails also depends on other factors such as deoxidation, casting, rolling, cropping, cooling and straightening practice.

If the failures due to other causes be regarded as a measure of the average severity of service to which the rails have been subjected, it shows that rails

of both processes have suffered an almost equal degree of severity of service, and therefore the two samples are comparable. The comparison is being continued.

TABLE 3. FAILURES DURING 1953, 1954 AND 1955 ON PLAIN AND SWITCH AND CROSSING RAILS LAID DURING 1950-55

Process of manufacture	Quantity supplied, 1950-55, tons	Failures per 100,000 tons supplied	
		Due to causes inherent in the rail	Due to other causes
Basic open hearth	1,109,000	7.7	13.3
Acid Bessemer ..	379,000	4.8	12.2

#### Left-Hand v. Right-Hand Rail

Equal populations of left-hand and right-hand rails made this comparison of plain rails a simple operation and revealed differences between the Regions. In the London Midland Region, during 1952-53-54, twice as many failures occurred in the right-hand than on the left-hand; this is thought to be due to the accumulated influence of corrosion-fatigue arising out of the discharge adjacent to the right-hand rail of continuous blow-down water from locomotives during the 1942-53 period. The opposite result obtained on the Western Region where the left-hand rail had 45 per cent more failures than the right-hand, possibly because of injector overflow and drippings. On the electrified lines of the Southern Region the failures were equally distributed, showing the absence of any effect due to cess and six-foot rail conditions.

#### High v. Low Rail on Curves

Here again, the populations for comparison were composed of equal numbers of rails. In each Region the low

rail was found to be more liable to failure than the high, and on the average the low rails had 70 per cent more failures than the high. This bias towards the low rail was shown by most types of failure, and especially by transverse failures starting from surface cracks caused by slipping wheels; it can be expected to be reduced as the average speed of freight trains increases.

The reason for this unequal incidence is thought to be the transfer of load from the high to the low rail on curves where the majority of trains pass at less than the speed for which the curve is canted.

#### Rail End Failures

As these accounted for 56 per cent of the failures on plain rails, they deserve more detailed analysis. Ninety per cent of them occurred on the running-on end of the rail. Half of them were associated with bolt holes, and of these, half had failed through the first bolt hole at an angle of 45 deg. to the horizontal, emerging from the rail end when the web joins the foot, and from the head some 4-6 in. from the end, as shown in Fig. 2; in a few cases another crack from the first bolt hole at 90 deg. to the first emerged from the end where the web joins the head and was liable to cause a piece of the head to become detached from the rail.

#### Bolt Holes

Sixty per cent of all the plain rail failures through bolt holes were classed as broken, and the remainder as cracked. Failures from bolt holes are particularly liable to occur in tunnels and on water troughs because a corrosive environment imposed on the stress-raising effect of the bolt holes causes rapidly-growing corrosion fatigue cracks. More than any other

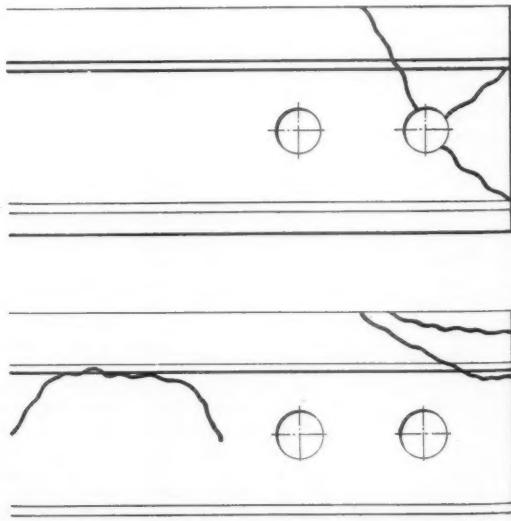
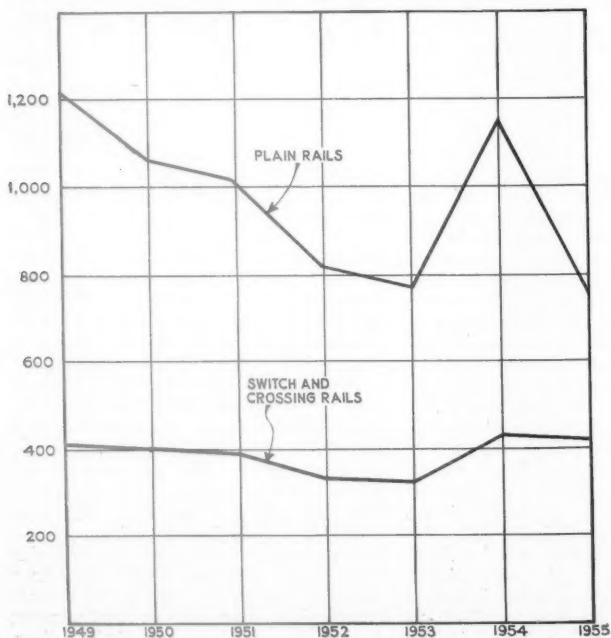


Fig. 1 (left)—Chronological course of failure position

Fig. 2 (above)—Typical failure through first bolt hole

Fig. 3 (below)—Three other forms of rail end failure

type, failures at bolt holes are particularly liable to occur late in the life of a rail, and this may be a result of the pulling-up of the fishplates against the web of the rail, consequent on fishing surface wear.

Three other forms of rail end failure are illustrated in Fig. 3; all are accelerated by the presence of corrosive conditions.

Rail end failures are primarily caused by the high local stresses imposed by the dynamic effect of rolling loads passing over these breaks in the continuity of the running surface. Their reduction is being sought by research into the design and maintenance of joints. The gradual introduction in suitable locations of continuous welded rails in place of rails with fished joints will in time contribute to this reduction.

#### Transverse Failures

These start from stress-raisers such as the corners of chair galls and corrosion pits on the bottom of the rail, or from transverse cracks on the running surface caused by the slipping or sliding of wheels, particularly on the low rails of curves. Very rarely are they associated with shatter cracks in the head, a manufacturing defect once very prevalent in the United States until the controlled cooling of rails was introduced at the mills. As transverse failures are likely to develop very suddenly from a small fatigue flaw, a relatively high proportion (70 per cent) are found in the broken condition. They are the most frequent form of failure among switch and crossing rails; in the case of plain rails the British Railways 109 lb. per yd. flat-bottom section is much less liable to transverse failure than the B.S. 95 lb. per yd. bull-head section on rails laid during 1950-55.

#### Causes Inherent in the Rail

Failures due to causes inherent in the rail accounted for 22 per cent of the plain rail, and 12 per cent of the switch and crossing rail failures during the period involved, or an annual average of 190 to 45 failures respectively. Not all of these were associated with manufacturing defects, but an average of 135 plain and 35 switch and crossing rails failed owing to longitudinal splits which usually originate at such defects.

Assuming the 35,900 miles of running line of British Railways to be composed of 60-ft. rail lengths, this is equivalent to 6,300,000 rails. If the above average rate of 170 longitudinal splits be assumed to apply over the 23 years' average life of rails in running lines, the chance of a rail failing owing to a longitudinal split during a 23 years' life works out at 1 in 1,600 rails under the conditions which obtained on British Railways' tracks during 1952-54. It is submitted that this low mortality rate is a measure of the efforts which are made by manufacturers and by inspectors to eliminate defective rails at the point of origin.

A minority of these failures are investigated metallurgically at the British Railways Research Department,

Derby, and are usually found to contain rolled-in pipes and segregations, surface laps and seams, strings of non-metallic inclusions, and other defects which were difficult or impossible to detect during visual inspection at the rail mill. The roller straightening operation normally reveals segregated rails by causing them to break and thus acts as an unspecified non-destructive test. It is surprising how easily a crack can start from some small defect or from a plane of low yield point caused by local deficiency in carbon.

The low rate of failures due to causes inherent in the rail may be a result of the very stringent falling weight test applied to rails purchased by British Railways. As shown by Mr. A. S. Babb in *Railway Steel Topics*, Vol. 3, No. 3, page 19, this test is much more severe than that specified for a similar rail section in any other country except India, South Africa and Switzerland, while in America the severity of the falling weight test is only about 40 per cent of that required by British Standard No. 11.

Despite the severity of this test, only 0.1 per cent of the casts of rails offered to British Railways during 1954 were rejected because of it, and a further 0.14 per cent were rejected for other reasons.

#### Seasonal Effect

The incidence of failure is 50 per cent higher during the winter than during the summer; this probably reflects the longer periods of wetness in winter and the higher stresses to which rails are subject during frosty weather.

The failures have also been analysed according to age of rail, loss in weight, total trains carried, and radius of curvature; distribution diagrams have been drawn, but in the absence of knowledge regarding the total population of rails of any particular age, loss in weight, and so on, it has been impossible to draw any valid conclusions. In any case, many of these items are mutually related so that it would be difficult to attribute failures to any one of them.

There is one item, however, which is known very accurately and can be used as a basis of comparison for some of the most failure-provoking features of the track; this is mileage of track under various conditions.

#### Tunnels and Water Troughs

British Railways have 526 miles of track in tunnels, and 45 miles of track on water troughs. On a track mileage basis, rails in tunnels had six times as many failures as rails elsewhere, (excluding troughs), despite the more frequent renewal of rails in the long and heavily-used (and therefore polluted) tunnels and the considerable mileage of short unpolluted tunnels which are not particularly susceptible to rail failures.

Water troughs are almost entirely confined to Class "A" lines (subject to speeds exceeding 60 m.p.h.), over which

12 or more express passenger trains operate regularly per 24 hr.) where rails have a higher liability to failure on account of traffic density and speed. This particular comparison has therefore been confined to rails on Class "A" lines. On a track mileage basis, rails on troughs had 20 times as many failures as rails elsewhere (excluding tunnels) despite the more frequent renewal of rails on troughs than elsewhere.

The trough failures include some described as "near troughs" where water splashing from the pick-up and overflow has wet the rails and accelerated failures; if the trough track mileage be doubled to include this carry-over, the failures per mile were 10 times as numerous as elsewhere.

If the effect of the more frequent renewal of rails in tunnels and on troughs be nullified by confining the analysis to rails under six years old, the disparity becomes almost fantastic; failures per mile on or near troughs were 80 times as high, failures in tunnels were 40 times as high as failures on rails elsewhere. This extreme disparity arises from the very low liability to failure during the first five years of rails laid elsewhere.

#### Traffic Density

There is no doubt that this factor is the prime cause of most rail failures, particularly those initiated by fatigue. Thus, failures per mile on Class A lines were five times as numerous as on lines of all lower classes taken together, and if the Regions of British Railways be arranged in order of failures per mile, they are in the same order as their average traffic densities.

The position of each failure during 1953-54-55 has been plotted on a map from which it can be seen that there were considerable stretches of track entirely free from failures during these three years. For instance, among tracks carrying 21-40 trains per day there were at least 30 integral lengths of over 40 track miles without a failure, and among tracks carrying 41-60 trains per day there were at least 50 integral lengths of over 20 track miles without a failure. The explanation for these examples of good rail performance would probably be found to be a high standard of maintenance and/or an absence of relatively-old rails, tunnels, water troughs, and high axle loads and speeds.

A special analysis of failures has been made on a mileage basis by adding together the failures on lines of similar traffic density. The analysis excluded the Greater London and other large industrial areas, but included about half the track mileage of British Railways and about half the total failures, and should therefore be representative. Up to about 30 trains per day, the failures per mile were roughly proportional to the number of trains per day and equivalent to about 1 failure per annum per 2,000 miles of track for each train per day. Above 30 trains per day the failures increased

out of all proportion; this may be because trains on busy main lines are generally longer and drawn by heavier locomotives at higher speeds than trains on infrequently-used lines.

There were wide variations from the average, and it is evident that the average number of failures per mile at any traffic density depends on the proportion of the track mileage involved which carries long and/or fast trains. This must be kept in mind when considering the grand average of plain and switch and crossing rail failures for all running lines on British Railways during 1953-54-55; this was 2.8 failures per 100 miles per annum for steam-operated lines, and 15 for electrified lines; the latter figure reflects the high traffic densities and the effect of the greater number of driving axles with multiple-unit stock on the lines involved.

#### Age of Rails

One important factor which has not been taken into account is the age of the rails involved, and through this, the number of trains carried by a rail before it failed. It was thought that the number of trains might be a suitable criterion to which liability to failure might be related, but the analysis showed that failures had occurred on rails which had carried anything between 1,000 and 1,000,000 trains, with the majority lying between 200,000 and 500,000 trains. With such a wide spread of values, it is clear that other factors besides the number of trains would have to be taken into account in determining a criterion for liability to failure.

Some railway administrations relate their annual rail failures to the gross ton-miles of traffic for the year concerned, but this ignores the effect of age of rail. The American Railway Engineering Association confines its annual analysis to failures which have occurred on rails up to 10 years old and relates them to track-miles of new rail rolled each year multiplied by the number of years in the track, but takes no account of the traffic density. It is clear that all these factors as well as speed and axle loads would have to be taken into account when comparing the rail failure statistics of different administrations.

If such a comparison were made, it would have to be remembered that a low number of annual failures per mile might be a reflection of low traffic density, low speed, over-frequent renewal of rails, or the use of an over-heavy rail section for the axle loads carried. The reverse of these conditions could result in a high failure rate; but this could also arise from the reporting of a large number of slightly cracked or damaged rails by vigilant staff, and through the use of crack-detecting devices. The total number of failures is of less importance than the number of broken rails, and it is encouraging that the annual number of broken rails reported by British Railways to the Ministry of Transport has

steadily decreased from 360 in 1952 to 263 in 1955; during these four years there were only six instances of passenger trains being derailed by broken rails, mostly cases of multiple transverse fractures caused by slipping wheels at or near stations where trains were moving slowly.

#### Prevention of Rail Failures

Since the liability to failure increases with length of service, a reduction in the annual number of failures could be achieved by renewing the rails more frequently than at present. Annual purchases of new rails by British Railways are equivalent to about 4.3 per cent of the running lines, or an average life of 23 years on such lines, although the actual life varies between 10 and 60 years according to local conditions.

To reduce the average life by one year would require about £420,000 a year for the cost of the additional new rails, plus the cost of laying them in the track. Conversely, £420,000 per annum could be saved if some failure-delaying feature could enable Civil Engineers to increase the average life from 23 years to 24.

Judging by its reduced liability to failures so far, the new British Railways 109 lb. per yd. flat-bottom section shows great promise towards the attainment of a longer average life than the old 95 lb. per yd. bull-head section. However, both sections are equally liable to damage from slipping wheels, and unless this can be reduced, it can be expected that an average of 130 rails will still have to be removed prematurely from the tracks each year for this reason; experience on the recently-electrified Manchester-Sheffield-Wath lines suggests that the even turning moment of electric locomotives does not make them less liable to slip than steam locomotives.

With half the plain rail failures occurring at the rail ends, the abolition of the fishplated joint is an obvious step towards a reduction of failures. Welded 180-ft. lengths of rail are already in use at many water troughs, and much longer welded lengths have been installed experimentally on most of the Regions of British Railways; further progress in this sphere depends on the provision of additional welding plants at depots and on the development of a satisfactory method for making the site welds between the long lengths welded in depots. The introduction of welded joints should enable a higher standard of maintenance to be attained at the reduced number of fishplated joints still remaining.

Research is proceeding on the prevention of failures at bolt holes by increasing the resistance to fatigue at these vulnerable spots; strengthening and smoothing the surface of the hole by cold-working, and cathodically-protecting the holes from corrosion by means of zinc washers on the fishbolts are two methods by which it is hoped to achieve this end. The effects of fatigue and fishplate wear can always be removed by cropping the rail ends,

drilling fresh holes and re-using the rails in sub-standard lengths, or by welding the cropped rails into longer lengths.

#### Ultrasonic Flaw Detectors

The growing use by British Railways of ultrasonic flaw detectors on rails in the track is likely to increase the number of rail failures as defined at present, but will have the ultimate effect of reducing the number of broken rails. Detector cars have been in use in the United States for many years and they detect about 20 flawed rails for each rail which fails in service. Detector cars have also been introduced recently on Continental railways, and will swell the rail failure statistics while adding to the security of the tracks. If the use of these new detection methods can permit the sound rails to remain longer in the track than they do now, their cost will easily be justified.

This article is published with the approval of British Railways, but the views expressed are those of the author.

#### New Features on Craven Machine Tools

(Concluded from page 508)

latter has a longitudinal traverse along slideways on the main bed for feed and quick power traverse motions.

The three spindles are driven together by a 25-h.p. variable-speed motor and reduction gear box at the left-hand end of the bed, coupled to a keyedway shaft between the bed ways. Bevel gearing and three worm gear reduction units housed in the rear of the headstock complete the transmission system and give a stepless range of spindle speeds from 28 to 84 r.p.m.

A range of five mechanically-operated feeds is provided for the cutter headstock in one direction only, the feed traverse being automatically tripped upon completion of the passage of the cutters through the work, before a quick power traverse in the return direction by a separate push-button controlled 3-h.p. motor.

The trepanning heads are arranged with Morse taper shanks to fit corresponding spindle nose bores and are secured in position by long retaining bolts passing through the spindles to the rear of the headstock. Each trepanning head has three inserted-type cutting tools and is suitable for one diameter of hole only.

**FRENCH ONE-DAY RAILWAY STRIKE.**—A one-day railway strike took place in France on October 25 as a protest by railway trade unions against slow progress in wage negotiations. Some 20 per cent of the main-line trains ran, but there were attempts by strikers at Calais to stop the "Golden Arrow" by piling sleepers on the tracks. Police who removed the obstruction were stoned by strikers. In Paris, less than a quarter of the usual Métro services were in operation.

## RAILWAY NEWS SECTION

## PERSONAL

Mr. D. C. Baijal, Secretary of the Indian Railway Board, has been appointed General Manager of the newly-formed North East Frontier Railway referred to elsewhere in this issue.

Mr. Alfred Illtyd Webber Jones, B.Sc., A.M.I.C.E., who, as recorded in our October 18 issue, has been appointed Chief Engineer

1873 and educated at Almondbury Grammar School and Huddersfield Technical School. In 1891 he became a premium apprentice with the L.N.W.R. at Crewe and, after drawing office experience, was appointed Locomotive Foreman at Ordsall Lane (Manchester). He subsequently transferred to Aston and Camden sheds in a similar capacity. Colonel Collins served during the South African war of 1901-02 with the Cheshire Regiment, was attached to the

Mr. M. Srinivasan, who has been Civil Engineer to the India High Commissioner, London, for the past three years, has left for Washington to join the Indian Supply Mission in connection with the procurement of iron and steel from the U.S.A. and Canada for India's Second Five-Year Plan.

Mr. G. S. M. Birch, who, as recorded in our October 25 issue, has been appointed Assistant Chief Solicitor, British Transport



Mr. A. I. Webber Jones

Appointed Chief Engineer of the  
Nigerian Railway



Mr. G. S. M. Birch

Appointed Assistant Chief Solicitor,  
British Transport Commission

of the Nigerian Railway Corporation, was born in 1895 and educated at Oundle and London University. He served through the 1914-18 war in Macedonia, Palestine, and France. Mr. Jones gained his engineering training in the Vulcan Foundry locomotive works and with the former North Eastern Railway. He was appointed an Assistant Engineer on the South Indian Railway in 1922, and retired as Deputy Chief Engineer in 1947. The following year he joined the Southern Region of British Railways and served in the Bridge Office on design until appointed to his new position of Chief Engineer of the Nigerian Railway last August.

The late Lt.-Colonel F. R. Collins, D.S.O., V.D., Officier Légion d'honneur, M.I.C.E., M.I.Loco.E., whose death was recorded briefly in our last week's issue, was Chief Mechanical Engineer of South African Railways from 1922 to 1929 and President of the Institution of Locomotive Engineers, 1937-38. Colonel Collins was born in

Royal Engineers and, later, to the Imperial Military Railways. Thereafter he was appointed Assistant Locomotive Superintendent, Bloemfontein, Central South African Railways, and, in 1903, District Locomotive Superintendent at that town, becoming Works Manager at Pretoria in the following year. He was appointed Superintendent, Mechanical & Motive Power, in 1908. During the 1914-18 war he commanded the South African Engineer Corps and was mentioned in dispatches. In 1916 he commanded the South African Railway Troops in France and was later appointed Assistant Director of Light Railways, 5th Army, was again mentioned in dispatches and awarded the D.S.O.; he was also made an Officer of the Legion of Honour. After the war he returned to South Africa and thence visited Canada and the U.S.A. before coming to London in 1920 as Advisory Engineer to the High Commissioner for the Union. He was appointed Chief Mechanical Engineer of South African Railways in 1922, and retired in 1929.

Commission, was educated at Westminster School. After being articled to the Solicitor to the former Southern Railway, he joined that company's legal staff on qualifying as a solicitor in 1933. After service in the R.N.V.R. he was commissioned in the Territorial Army in 1937. During the war he served in various anti-aircraft units, and latterly in the department of the Judge Advocate General in India. He became a member of the Commission's Legal Service on its formation, and has held the appointment of Assistant Solicitor at the Commission's headquarters since July, 1954.

We regret to record the death on October 6 of Mr. Henry Frank Hilton, a well-known authority on several aspects of railway history, and a contributor to many journals, especially as regards the Great Eastern Railway. His *History of the Eastern Union Railway* was published by the L.N.E.R. a few years before nationalisation. Mr. Hilton was born on July 29, 1877. He began his railway career in 1892 at the



Mr. H. J. Evans

Appointed Organisation & Methods Officer  
British Transport Commission



Mr. H. H. Matthews

Architect, London Midland Region,  
British Railways, 1955-57



Mr. R. F. Bonny

Appointed District Engineer, Norwich,  
Eastern Region

G.E.R. Locomotive Works at Stratford as a Premium Apprentice. From 1898 to 1900 he was a draughtsman in the Works Manager's Drawing Office and, in 1900, became a Locomotive Inspector in charge of Holden's liquid fuel experiments. He was appointed Assistant District Locomotive Superintendent, Stratford, in 1902, District Locomotive Superintendent, Cambridge, in 1905, and seven years later District Locomotive Superintendent at Stratford. As a result of the re-organisation following Sir Henry Thornton's appointment as General Manager and Engineer-in-Chief of the G.E.R., Mr. Hilton was transferred to Liverpool Street as Assistant to Divisional Operating Superintendent in 1915, and two years later was transferred to the Office of the Superintendent of Operation for special duties in connection with traffic working. From 1920 to 1924 he was Train Working Assistant to the Superintendent of Operation, and from the latter year until his retirement in 1927 he was Assistant to the Locomotive Running Superintendent of the L.N.E.R. Southern Area for special duties.

Mr. H. J. Evans, who, as recorded in our October 25 issue, has been appointed Organisation & Methods Officer, British Transport Commission, was educated at Latymer Upper School, Hammersmith, and began his career with the Post Office in 1938. After a period of training in Glasgow and Edinburgh he was assigned to the Telephone Manager's Office at Aberdeen. During the war he served in the R.A.F. as a Signals Officer, attaining the rank of Flight Lieutenant. On demobilisation he returned to Aberdeen, and, in 1950, was promoted to the position of Senior Telecommunications Superintendent in the Inland Telecommunications Department at Post Office headquarters in London. In 1954, he was appointed Senior Executive Officer in the Central Organisation & Methods Branch at Post Office headquarters, and during the past 3½ years has reviewed and reported on the organisation of, and methods employed in, various Departments at Post Office headquarters. During the same period Mr. Evans has attended the Treasury O. & M. Training Course and the residential Post Office Management Training Course. He holds a second class Honours degree in

Mathematics and Physics of London University, and is a Fellow of the Royal Statistical Society.

Mr. H. H. Matthews, Architect, London Midland Region, British Railways, who, as recorded in our October 25 issue, retired on October 23, has completed 45 years of service. Mr. Matthews joined the architectural staff of the former Midland Railway in 1913 at Derby after completing five years' articles with a private firm. After serving in France and Salonica in the 1914-18 war he resumed his railway duties in 1919 and was engaged on various schemes including the Barking-Uptonwidening and the reconstruction of a number of stations on the Southend line. He was appointed Divisional Quantity Surveyor in 1930 and, five years later, became Senior Assistant Architect. In this capacity he was responsible for the alterations and remodelling of the L.M.S. hotels at Edinburgh, Glasgow, Dornoch, and Kyle of Lochalsh. He was also responsible for the erection of the School of Transport at Derby and the Prestatyn Holiday Camp. Among his more recent activities have been the provision of staff amenities buildings in all parts of the London Midland Region and the Horwich, Crewe, and St. Pancras Apprentice Training Schools. He was appointed Principal Assistant Architect, London Midland Region, in 1950, and Architect in 1955.

Mr. I. M. Campbell, Assistant District Engineer, Sheffield, Eastern Region, British Railways, has been appointed District Engineer, Kings Cross.

Mr. D. de Jonk, Operating Superintendent, Ceylon Government Railway, has proceeded on retirement leave.

We regret to record the death on October 25, at the age of 82, of Mr. A. Winter Gray, O.B.E., Secretary of the Institute of Transport from 1923 to 1941.

Mr. H. P. Steele has been appointed Divisional Superintendent, "B" Division (Northern & Northern City Lines), London Transport Executive, with the rank of Principal Executive Assistant. Mr. Steele, who is 51, joined the London Electric Rail-

ways in 1922 as a junior clerk in the Chief Passenger Agent's Office. He was transferred in 1923 to the Operating Department, appointed Assistant Traffic Controller in 1932 and selected as an Operating Trainee in 1938. He has since served as a Divisional Inspector, Assistant District Traffic Superintendent and Training Assistant, and was Superintendent (Staff) immediately before his present appointment. He is a graduate of the Institute of Transport and is Chairman of the L.T. (London Electric Railways) Athletic Association.

Mr. R. F. Bonny, Works Maintenance Assistant, Chief Civil Engineer's Office, Kings Cross, Eastern Region, British Railways, who, as recorded in our October 4 issue, has been appointed District Engineer, Norwich, was educated at the Whitgift Middle School, Croydon, and St. Catharine's College, Cambridge, where he gained 1st Class Honours Mechanical Science Tripos. He entered railway service in 1930 as a graduate pupil in the New Works Section of the Engineer's office, Kings Cross, L.N.E.R., transferring to the Bridge Office in 1931. He acted as Assistant to the Resident Engineer on the Shenfield Widening scheme in 1932 and 1933 and as Resident Engineer on the Welsby Road Bridge and Subway, Grimsby, in 1933 and 1934, returning to the New Works office at Kings Cross in 1935. He resumed as a Resident Engineer in 1936 on the Valley Road Bridge at Nottingham and, from 1937 until 1942, was Resident Engineer in connection with new works between Liverpool Street and Stratford on the electrification scheme. In 1943 Mr. Bonny was appointed Chief Assistant in charge of the Engineer's Maintenance Drawing Office at Kings Cross, in 1946, Assistant District Engineer, Cambridge, in January, 1953, Assistant District Engineer, Kings Cross, in November, 1953, Acting Assistant District Engineer, Stratford, and, in 1955, Works Maintenance Assistant, Chief Civil Engineer's Office, the position he now leaves.

Mr. A. T. Chapman, Stationmaster, Victoria, Southern Region, British Railways, is retiring. He will be succeeded by Mr. W. T. Fearne, at present Stationmaster at London Bridge.

The following Divisional Traffic Managers have been appointed by British Railways, London Midland Region, as from November 1:—

Mr. T. P. Strafford, Nottingham.

Mr. R. L. E. Lawrence, London.

Mr. M. G. E. Lambert, Liverpool.

Mr. Strafford is at present Divisional Operating Superintendent, Derby; Mr. Lawrence is Modernisation Assistant (Operating), and Mr. Lambert is District Goods Manager, Manchester.

The London Midland Region of British Railways announces the following appointments:—

Mr. M. G. E. Lambert to be Divisional Traffic Manager, Liverpool, with effect from November 1, 1957.

Mr. R. L. E. Lawrence to be Divisional Traffic Manager, London, with effect from November 1, 1957.

Mr. T. P. Strafford to be Divisional Traffic Manager, Nottingham, with effect from November 1, 1957.

Mr. W. R. Headley to be Architect, Euston.

Mr. H. A. Roberts to be District Engineer, Liverpool.

Mr. H. L. Hall to be Assistant (Staff Commercial), Euston.

Mr. H. Wilkinson to be Assistant (Staff Motive Power), Euston.

Mr. T. R. Harrison to be Assistant (Staff Operating), Euston.

Mr. J. C. Boustead to be Signalling Assistant, Euston.

Mr. F. J. Burge to be District Operating Superintendent (Temporary), Derby.

Mr. F. Walton to be District Operating Superintendent (Temporary), Liverpool (C.L.).

At a recent meeting of the British Transport Commission Shipping Services Managers' Committee, held at Dover, a presentation of a silver tankard was made by colleagues to Mr. L. H. K. Neil, retiring Continental Traffic & Shipping Manager, Eastern Region, British Railways. The photograph in the adjoining columns shows (left to right): Seated—Mr. A. Stewart, General Manager, Caledonian Steam Packet Co. Ltd., Mr. J. L. Harrington, Chief Shipping & International Services Officer, B.T.C., Mr. L. H. K. Neil, Mr. R. H. Hacker, formerly Chief Officer (Continental), B.T.C., Captain J. D. Reed, Manager, Irish Shipping Services. Standing—Mr. R. T. M. Wormald, Assistant Divisional Shipping Manager, Dover, Mr. L. E. Marr, General Manager, Associated Humber Lines Limited, Mr. T. R. Hawkes, Regional Accountant, Eastern and North Eastern Regions, Mr. H. J. Locke, B.T.C. (Secretary), Mr. R. E. Sinfeld, Shipping & Continental Manager, Southern Region, Mr. F. W. Case, Revenue Accountant, Southern Region, Mr. John H. Bustard, General Manager, Atlantic Steam Navigation Co. Ltd., Mr. C. C. Inglis, Chief Research Officer, B.T.C., Mr. F. Marsden, Assistant Irish Traffic Superintendent.

The Wakefield Group, headed by C. C. Wakefield & Co. Ltd., has been a large-scale producer of chemical additives for the lubricating oils of its own manufacture for many years. In future, certain of these additives will be available to the outside market as will other of the Group's chemical products not necessarily connected with lubricants. The chemical products of the Group will be marketed through its member company, Edwin Cooper & Co. Ltd., the board of which has been reconstituted as follows:—Mr. L. M. Broadway (Chairman), Mr. W. Helmore (Deputy Chairman), Mr.

G. H. Thornley (Managing Director), Mr. W. F. List, Mr. G. E. T. Eyston, Mr. J. A. V. Watson, Mr. L. G. Packham, Mr. L. Colkett (and Secretary), Mr. J. C. Cragg, Mr. C. R. Woodfield.

The Stella Lamp Co. Ltd. announces that Mr. W. P. B. Grey has been appointed Sales Manager, Southern Area, as from September 1.

Mr. J. N. Davenport has been appointed Lighting Representative for the Bolton/Wigan Area of the North West Region of Philips Electrical Limited.

Mr. W. A. Wood has been appointed Commercial Manager of A. W. Chapman Limited. Mr. R. L. Harrison becomes Sales Manager.

Viscount Knollys, Chairman of Vickers Limited, is leaving London to-morrow for South America. He will visit Venezuela, Colombia, Peru, Chile, Argentina, Uruguay, and Brazil.

Mr. Charles Holt, who for some years has been a Director of Dean & Dawson Limited, has been appointed General Manager of that company with effect from November 1, 1957.

Mr. L. C. Maddock has been appointed Assistant Chief Accountant of the Thos. Cook & Son Ltd. Group, with effect from November 7, 1957.

Mr. David Fay, Director & General Manager of Dean & Dawson Limited, relinquishes his appointments on retirement, with effect from October 31 after 35 years of service. Mr. Fay was born in 1901 and educated at Marlborough. He began his career with the Great Central Railway in 1920, and was seconded to Dean & Dawson in 1922. He formed the banking department of Dean & Dawson, instituting a system of traveller's cheques which remained in use until the company's postwar association with Thos. Cook & Son Ltd. In recent years he has served on the Council of the B.T.H.A. and was Chairman of the Roadways Committee of A.B.T.A. for a number of years.

Mr. Charles K. Turner-Hughes has been appointed Chief Sales Executive of Simms Motor Units Limited.

Metropolitan-Vickers Electrical Export Co. Ltd. announces the appointment of Mr. W. A. Hardman as Manager, Eastern Division, in succession to the late Mr. R. V. D. Kirby. India, Pakistan, China, Malaya and Ceylon are among the principal countries comprising the Eastern Division.

Mr. D. E. S. Isle has rejoined the Solartron Electronic Group as Technical Assistant to Mr. J. Graham Cooke, Director of Advertising & Publicity. Mr. Isle will be primarily responsible for the processing of technical sales literature and the organising of technical articles.

Sir Edward Thompson has been elected President of the British Engineers' Association. He is Chairman & Joint Managing Director of John Thompson Limited. Mr. A. I. Baker, Chairman of Baker Perkins Limited, has been elected Vice-President. The retiring President, Mr. W. K. G. Allen, Chairman & Managing Director of W. H. Allen, Sons & Co. Ltd., has been elected Honorary Treasurer.

Major Richard Miles and Sir Owen Wansbrough-Jones have been appointed part-time members of the National Research Development Corporation for three years. The part-time appointments of Professor P. M. S. Blackett, Mr. J. F. Lockwood, and Sir Rowland Smith have been renewed for a further two years, and that of Sir John Duncanson for a further year. Major Miles is Chairman & Managing Director of Head, Wrightson & Co. Ltd.

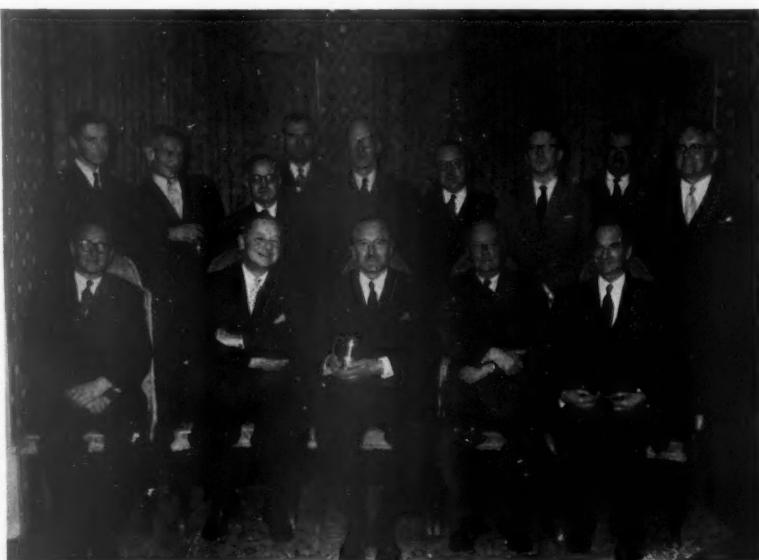
**INSTITUTION OF LOCOMOTIVE ENGINEERS**  
The following additions have been made to the Register of Members of the Institution of Locomotive Engineers:—

*Graduate*

Mr. A. H. Griffiths, Trainee, British Railways, Eastern Region, Stratford.

*Re-instated to Graduate Membership*

Mr. G. R. M. Miller, Shedmaster, British Railways, Scottish Region, Ayr Motive Power Depot.



Mr. L. H. K. Neil (centre), retiring Continental Traffic & Shipping Manager, Eastern Region, British Railways, receives a presentation—see adjoining column

## NEW EQUIPMENT AND PROCESSES



### Steam-Heated Air Towel

A SMALLER version of a four-man air towel has been developed. Suitable for fitting into the corner of a toilet, this two-man model is designed for the drying of hands, face, arms and hair by means of jets of warm air, thus obviating the need for towels and decreasing the risk of spread of infection thereby.

The model has two drying positions and two foot pedals, and is available in three different speed ranges and with a motor suitable for three-phase a.c., single-phase a.c. and d.c. supplies. The air towel is self-standing, only requiring a flat surface, no base fixing being required. Normally mounted with the back as close as possible to the wall, an air intake is pro-

vided under the top cowl well above floor level.

Direct access to the electric motor and terminal box and other servicing, is obtained by removing the semi-circular centre cover. Steam is normally left on during working hours depending on operational requirements. Where more than one unit is installed one motor can be left running continually throughout the shift for immediate availability, the other unit(s) being switched on at peak time as required. Alternatively the motor can be switched on two or three minutes before the end of the shift and switched off again at the end of the break period; or a time switch can be arranged to control the motor so that the unit is always available at normal washing periods. An overriding manual switch for occasional use is then made necessary if the machine is required outside the normal washing period.

The price of the two-man model with a three-phase motor is £70; with a single-phase motor, it is £74. Delivery is at present approximately eight weeks. The manufacturer is the Spiral Tube & Components Co. Ltd., Air Towel Division, Osmaston Park Road, Derby.

### Compact Fire Extinguisher

WITH applications to diesel trains and other situations where oil is employed, or where electrical equipment is installed and so on, the Model 1604, dry powder fire extinguisher has been produced to be used on fires of inflammable liquids of all types.

Tests, it is stated, have shown that it has an efficiency greatly in excess of any other commercially-available extinguisher of comparable size. An example of its effectiveness is that, in the hands of an inexperienced operator it will quell a petrol fire of 9 sk. ft. area. The extin-

guishing capacity is stated to be due to the nature and preparation of the dry powder combined with the method whereby it is expelled, so that an excess of powder in any part of the cloud is avoided. The powder will not coagulate inside the container, it is further claimed.

The compact unit is 15*1*/*2* in. high and weighs 10*1*/*2* lb. A pressure gauge is fitted so that at a glance a user can confirm that the extinguisher is charged and ready for action.

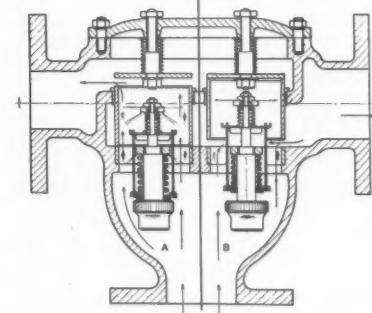
The operating head contains a strike knob and a nozzle. A strong rubber carrying handle, shaped like a pistol grip, makes it possible to aim accurately at the heart of a blaze, even in the dark.

When the knob is struck, a fan-shaped cloud of fire-killing powder is expelled through the nozzle with a range in still air of 10 ft. at 65° F. The cloud is 4 ft. wide and 2*1*/*2* ft. deep. As the extinguisher is a total discharge model, once the seal has been pierced, the flow cannot be stopped.

The extinguisher is available from stock. Price and other details may be obtained from Nu-Swift Limited, Elland, Yorks.

### Thermostatic Control Valve

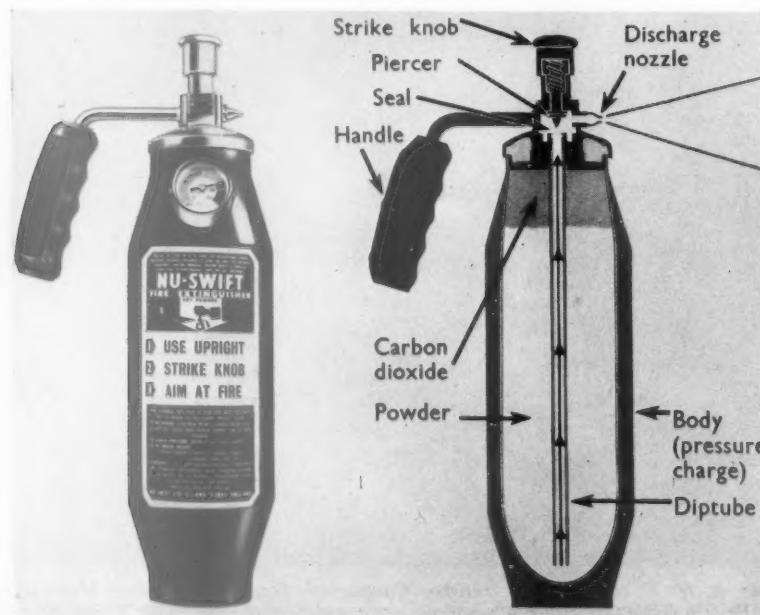
THE Waxtrol coolant valve has been developed to be entirely suitable for large engines as employed in traction units and so on, where high pressures and heavy service are normally encountered. The valve incorporates powerful wax-



filled elements which although very sensitive are claimed to be practically indestructible. The operating element consists of a container filled with the special wax and sealed with a flexible diaphragm and plug. A change in state of the wax occurs at the operating temperature, causing a rapid increase in volume and power output. The valve unit, consisting of a piston assembly connected to a cylindrical slide valve, is actuated by this expansion. This extrudes the flexible plug into a reduced diameter in the piston housing thus magnifying the movement of the piston which overcomes a return spring and moves the valve upwards against a fixed seat.

The inlet port is connected to the inside of the cylindrical valve and the coolant is passed either over the top of the cylinder or the by-pass, or under the cylinder to the heat exchanger.

The operating units are constructed from good quality materials and the valves can be provided either in cast iron with gunmetal trim, or in gunmetal with



gunmetal trim. The standard models have cast iron bodies which are satisfactory for the majority of applications and less expensive than gunmetal. The elements are quite unaffected by extremes of temperature or pump pressure, it is stated, and calibration is permanent, tamper-proof, and unaffected by pressure surge.

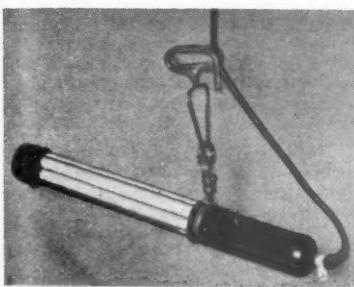
The diagram shows, on the left-hand side, the operating element in the open position, as would be the case when the engine was cold and the coolant being recirculated; the right-hand side shows the element in the closed position as when the coolant was being passed through a radiator or similar component.

Further details of the Waxtrol coolant valve can be obtained from the manufacturer, Teddington Industrial Equipment Limited, Sunbury-on-Thames, Middlesex.

### Robust Inspection Lamp

THE Genflouir industrial fluorescent inspection lamp appears suitable for application to railways because it is shock-proof, intrinsically safe and water-tight.

The lamp is of robust construction combined with the light weight of 3½ lb. It can be dropped from a height of 4 ft. on



to a concrete floor without any resulting damage; it can also be used under water, hung by its flex so as to direct illumination in any required direction, or held in the hand for long periods without fatigue. The light output is flickerless, and non-shadow forming within a range of 1 ft. of the lamp.

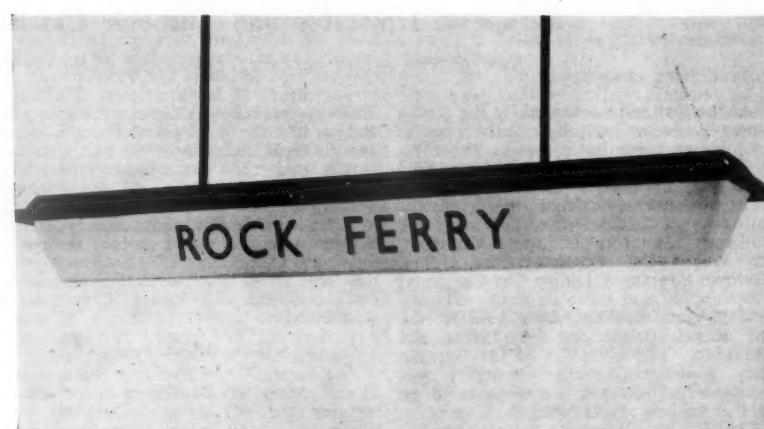
The lamp is being manufactured in two sizes: Type 2/6 W. with 8-in. tubes and a 12-W. output, and Type 2/8 W. with 11-in. tubes and a 16-W. output. Standard voltages of 220/250 V. a.c., are intended. Both lamps are 2½ in. dia., and are 16½ in. and 19½ in. long respectively. The lamp has a life expectancy of 5,000 hr.

Further details may be obtained from the manufacturer, Gennar Engineering Limited, 99, Old Street, London, E.C.1.

### Platform Lighting Fittings

A DESIGN of fluorescent lighting fitting for mounting under station platform canopies has recently been supplied by the manufacturer to the London Midland Region of British Railways. It is made in two sizes, one for 4-ft., 40-W. and the other for 5-ft., 80-W. tubes; each size accommodates either one or two tubes of these ratings.

The fitting comprises a galvanised body, which may be painted in Regional or other colours, and a Perspex bowl on which the station name appears in ½ in. Perspex letters coloured similarly. Suspension may be by ½-in. conduit, for which two entries



are provided at the top, or the fitting may be mounted direct on the canopy.

The bowl is hinged to the body of the fitting and secured by six or eight Dzus fasteners according to the size of the lamp. When opened, it can be detached completely from the fitting by lifting it off the hinges. A tray with instant start gear is carried on top of the white enamelled reflector. The tray incorporates a socket for the connection from the mains and is fitted with a rewirable fuse. Keyhole slots in the reflector enable the assembly to be removed for access to the gear by slackening two screws and sliding the reflector sideways.

Prices of the fittings and further details can be obtained on application to the General Electric Co. Ltd., Magnet House, Kingsway, London, W.C.2.

### Diesel Fuel Filter

THE Fram two-stage filter provides diesel fuel free from water and is designed for all types of diesel applications including locomotives.

With the increasing use of fuel-operated hydraulic servo-governors and the introduction of higher operating speeds, it is apparent that the presence of water in the fuel in an emulsified form, even in very small percentages, can quickly lead to operational difficulties. Corrosion will be set up in governors destroying their sensitivity, and corrosion fatigue can result in failure of injection pump plunger springs.

The two-stage filter is specifically designed for engine mounting and to provide for the supply of completely clean and water-free light diesel fuel. It is initially offered in two sizes and consists basically of two special cartridges.

The first and lower cartridge, the coalescer cartridge, through which the fuel flows from inside to out, performs the dual function of separating all dirt, coalescing emulsified water into droplets of an appreciable mass. These will normally sink to the bottom of the filter body on emergence from the cartridge. If any minute particles are carried on with the fuel, these will be rejected as the fuel flows from outside to inside the second and top separator cartridge, which is rendered extremely hydrophobic by a special process.

The top cartridge does not deal with dirt, its function being only to reject any carried-over free water. Theoretically its life is infinite, but under servicing conditions it should be changed once a year. The lower coalescer filter cartridge needs to be replaced every 2 to 3 months.

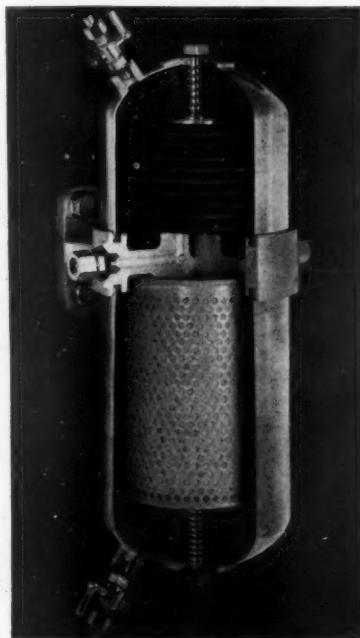
The Fram two-stage filters are being manufactured by Simmonds Aerocessories Limited, Treforest, Pontypridd, Glamorgan.

### Cutting Oil for Painted Articles

THIS oil, Kalsol Apros soluble cutting oil, has been produced to be suitable for use when machining articles which have been painted ready for assembly. Apros oil, it is stated, can be used safely without any tendency to remove the finish.

It provides adequate cooling and gives good tool life at a 30 to 1 dilution. It should not be used at a greater concentration than 15 to 1 if the advantage of its inertness to paint is to be retained.

The price of the cutting oil in 5 gal. drums is 8s. per gal., and in 40-gal. drums is 6s. 9d. per gal. Both these prices include delivery. Delivery can be made within 10 days. The manufacturer is K. Allan & Co. Ltd., Alanzol Refinery, Bream, Nr. Lydney, Glos.



## European Timetable and Through Carriage Conference

New Ostend-Milan car/sleeper service: "Rheingold" accelerated

At the invitation extended by the Italian State Railways at the conference at Lisbon last year, the European Timetable & Through Carriage Conference was held this year in Naples on October 2-12. Delegates attended from most of the European and from the Turkish State Railways, also from Transport Ministries, the Wagons-Lits Company, the D.S.G. (German Sleeping & Dining Car Company) and shipping and other interests. Plenary sessions and meetings were held in the old Royal Palace in the Piazza del Plebiscito. The invitation of the German State Railway (Eastern Germany) was accepted for next year's conference to be held in Leipzig on October 8-18.

The British Railways' delegation consisted of:—

**Southern Region:** Mr. R. E. Sinfield, Shipping & Continental Manager; Mr. S. A. Fitch, Chief Operating Superintendent; Mr. H. J. Bourn, Continental Superintendent; Mr. W. J. Nigh, Passenger Assistant to Continental Superintendent; Mr. H. B. Colgate and Mr. S. W. Robins, Continental Superintendent's Office; and Mr. W. Spengler, General Agent for Italy.

**Eastern Region:** Mr. L. H. K. Neil, retiring Continental Traffic & Shipping Manager; Mr. S. A. Claydon, Deputy Shipping Manager & Port Superintendent (now Continental Traffic & Shipping Manager); Mr. E. F. Abbott, Chief of Passenger Section, Continental Traffic & Shipping Manager's Department; and Mr. C. H. Archer, Continental Traffic & Shipping Manager's department.

The agenda covered a variety of matters, with timetable and through carriage questions relating to European express services, car-sleeper services, and so on. The Brussels Exhibition, to be held next year, will attract visitors from many countries in Europe, and this factor had some bearing on decisions relating to certain train services.

As usual, the first few days of the Conference were devoted to the framing of the timetables for the principal European expresses, such as the "Simplon-Orient," "Arlberg-Orient," "Orient," "Tauern," "Nord" and "Jugoslavia Express"; the plenary sessions and commercial and group timetable meetings occupied the second week. Managing administrations of the main expresses again sought to obtain accelerations over sections of the lines with a view to overall reductions in journey time next year, and particular attention was given to improvements in timekeeping. Where possible, advantage was taken to revise train running in consequence of electrification, but some railways are still engaged in electrification work, the result of which will not be felt until a year or so hence.

The 1958 summer timetable will apply from June 1 to September 27 inclusive. Brief information on the decisions reached on the principal trains connecting with steamship services from and to Great Britain is given below.

### "Simplon-Orient Express"

The east- and westbound trains will be accelerated, leaving Paris Lyon, eastbound, at 9.5 p.m. (instead of 7.54 p.m.) and arriving at 8.30 a.m. (9.25 a.m.); the earlier arrival, westbound, will afford a connection with the 10 a.m. service from Paris St. Lazare via Dieppe/Newhaven.

Electrification of the Czechoslovak State

Railways between the German frontier and Prague and the conduct of formalities in the "Orient Express" by the Czechoslovak authorities are expected to result in improved punctuality of the Prague-Warsaw branch of this train. In general no great acceleration has been possible, despite electrification of part of the route in South Germany. The Bucharest portion will arrive Bucharest 37 min. earlier eastbound and will depart 50 min. later westbound.

### "Arlberg-Orient Express"

The possibility of avoiding the working of this express via Strasbourg in the winter (outside the winter sports period) was raised, but it was decided to continue these arrangements. For the winter 1958-59 the train will run via Strasbourg from September 28 to December 18 and from March 8 as from Paris and, in the direction from Basle, daily from September 28 to December 20 and from March 10. During the summer and in the winter sports period, the "Arlberg-Orient Express" will leave Paris Est at 10 p.m. via Belfort. Timings for 1958 will be practically the same as for this year, but the westbound departure time from Bucharest will be at 11.40 p.m., instead of 10.55 p.m.

### "Kärnten Express"

In compliance with a request made by the Belgian National Railways, and to provide an additional service for visitors to the Brussels Exhibition, it was agreed that the "Kärnten Express," which has hitherto operated for a period each summer, should run throughout the summer as from June 1, 1958. Through coaches will run from Ostend Quay to Salzburg and Klagenfurt in connection with the afternoon service from Victoria.

### London-Paris Services

The 9 a.m. service from Victoria to Paris Nord via Folkestone/Boulogne, which operated last summer, will be reintroduced on June 1, 1958, and remain in force until September 28, 1958, one day after the termination of the summer service. In the return direction passengers by this route will leave Paris Nord at 1.48 p.m., as before.

Other departures from Victoria by the Short Sea route will be: 11 a.m. via Dover/Calais; 1.30 p.m. and 2.0 p.m. ("Golden Arrow") via Folkestone/Calais. In the case of the morning Calais service from London Victoria a slight re-timing of the steamer service will be made and the sailing time from Dover will be 1.5 p.m. (instead of 1 p.m.). The night service to Paris via Dover/Dunkirk will be unaltered, and the night service via Southampton/Havre will operate thrice weekly (Waterloo dep. 9 p.m.). Timetables for the service between London and Paris via Newhaven/Dieppe will be finalised this month.

To provide additional train accommodation from Calais for passengers by the 11 a.m. service from Victoria next summer, arrangements will be made by the French Railways for Train 84 to run in the following times daily throughout the summer service period: Calais Maritime dep. 2.52 p.m., Paris Nord arr. 6.56 p.m.

In the inwards direction (Paris/London) the boat train from Paris Nord in connection with the Calais/Dover steamer service will be re-timed as from June 1,

1958, and Train 69 will leave Paris Nord at 12 noon (instead of 11.48 a.m.), whilst the "Golden Arrow" will leave the Gare du Nord at 12.36 p.m. (instead of 12.24 p.m.). These later departures from Paris have been brought about in consequence of the re-timing of the Calais/Dover steamer service which next summer will be scheduled to depart from Calais at 4.20 p.m. (instead of 4.5 p.m.) so as to afford more time at Calais for the various port operations. It is hoped that this revision will result in improved punctuality.

### Dover/Ostend Night Service

The night service to Belgium will be repeated for the 1958 summer season, but the boat train in connection with the Dover/Ostend night steamer will leave Victoria at 11 p.m. (instead of 10.30 p.m.). The steamer arrival at Ostend will be one hour later than hitherto, i.e., 5.45 a.m. The period of operation of the Ostend night service from London will be nightly from June 27 to September 13.

### "Saphir" High-Speed Diesel Train

The "Saphir" diesel train (a "Trans-Europe Express"), at present running from Ostend Quay to Cologne and Dortmund in connection with the morning Ostend boat train from Victoria, will run daily from Ostend to Cologne and Frankfurt and vice versa instead, commencing June 1.

### Ostend-Milan "Car-Sleeper"

A feature of the 1958 "car-sleeper" arrangements will be the introduction in June of a new service between Ostend and Milan in connection with the Dover-Ostend car carrier. Passengers will leave Dover at 11.15 a.m. on Saturdays from June 28 to August 30 and connect with the car-sleeper train from Ostend at 5.7 p.m., via Brussels-Namur-Luxembourg-Basle and the Gotthard, and will arrive in Milan at 10.10 a.m. the following day. Northbound motorists and their cars will leave Milan on Sundays from June 29 to August 31 at 7.15 p.m. and arrive Ostend at 11.20 a.m. next morning, crossing from Ostend to Dover by the Belgian Marine car-carrier vessel. This service to and from Italy will operate in conjunction with the car-sleeper service between Schaerbeek and Milan and a through sleeping car will run between Ostend and Milan. The maximum number of motorcars conveyed will be 10.

The car-sleeper service from Boulogne to Lyons and back, which was inaugurated this year in connection with British Railways car-carrier service between Dover and Boulogne, will be re-introduced in May, 1958, and operate on six days a week each way instead of three days a week. The Boulogne-Lyons car-sleeper train will convey a maximum of 95 cars and sleeping accommodation for passengers accompanying the cars will be in the form of sleeping car berths or couchettes.

### "Rheingold" Accelerated

Largely as the result of electrification in the Rhineland and South Germany, the "Rheingold" will be slightly accelerated. The departure from the Hook of Holland will remain at 6.30 a.m., but the arrival at Basle S.B.B. will be 32 min. earlier than at present. Northbound departures from Basle S.B.B. will be 32 min. later

than now, whilst the arrival at the Hook of Holland will only be 15 min. later. The later arrival at the Hook of Holland (11.25 p.m.) was accepted with reluctance, but the number of passengers conveyed by this train is comparatively light, and it was felt that difficulties would not thereby arise at the Hook and, in any case, an improvement could be looked for in the future with further electrification.

The "Loreley Express" will leave the Hook of Holland at 7.15 a.m. as at present and will reach the Hook of Holland on the return at 11.12 p.m., slightly later than at present. With electrification, Basle S.B.B. will be reached 61 min. earlier than at present, and the departure from Basle S.B.B. on the return will be 1 hr. 43 min. later than now. In addition to the normal through coaches Hook-Basle and Hook-Stuttgart/Munich there will be vehicles Hook-Erfeld and the restaurant car will be worked Hook to Lucerne and return.

#### London-Hamburg Express

The eastbound train will reach Hamburg Hbf. at 11.55 p.m. and in the reverse direction will depart at 6.44 a.m. The "Hamburg Express," leaving Copenhagen at 10.15 p.m., will continue to make connection with the "Hamburg-London Express" at Hamburg Hbf., with a connection from Stockholm to Copenhagen.

#### Harwich/Hook Steamer Sailings

Although there is to be acceleration of trains which, in some cases, will give later departures from the Hook of Holland and earlier arrivals there on the return, the "London-Hamburg Express" is to be continued for a further experimental period in the timings Hook dep. 5.45 p.m., on the return Hook will arrive 12.57 a.m.; in consequence the steamer will continue to leave Parkeston Quay West at 11.15 a.m. (departure from Liverpool Street 9.5 a.m.) and return from the Hook of Holland at 1.5 p.m. (Liverpool Street arrive 9.30 p.m.).

### Extension of Ilford Car Depot

When electrification of the Liverpool Street suburban lines and the Tilbury Line of the Eastern Region is completed, facilities will be required for the maintenance, cleaning and periodic overhaul of the greatly increased number of multiple unit electric trains which will then be in service in the London area. With this in mind the Region is to extend the existing electric train depot at Ilford.

The main feature will be a new combined inspection and cleaning shed, 656 ft. long and 257 ft. wide. This will contain 16 tracks, each one with an inspection pit 616 ft. long. The existing inspection shed and repair shop is to be converted to deal with the periodic overhaul and heavy repair of multiple unit electric rolling stock.

Workshops and staff amenities are to be provided adjacent to the new inspection and cleaning shed. There will also be stores accommodation with road and rail access.

#### Washing Plant

The work also includes a new carriage washing plant, similar in design to the existing washer. A drainage apron will be provided for the flushing of lavatory stock.

Upon completion of the scheme, the Ilford depot will undertake day-to-day maintenance of all electric stock on the Liverpool Street suburban lines (Chelms-

ford, Southend Victoria, Enfield, Chingford, Hertford East, and Bishop's Stortford). Day-to-day inspection and cleaning of Chelmsford and Southend Victoria stock will also be carried out at Ilford; but for operating reasons the daily inspection and cleaning of rolling stock on the Enfield, Chingford, Hertford East and Bishop's Stortford services will be dealt with at specified points on these routes.

The periodic overhaul and heavy repair of all electric stock working on the Eastern Region suburban services, including the Tilbury Line stock, will be carried out at the enlarged depot.

Ilford car depot was completed in 1949 and at the present time deals with the maintenance, repair, and cleaning of 92 three-car and 32 four-car electric multiple-unit sets.

### New Lister-Blackstone Company Formed

A subsidiary company has been formed to handle the rail traction application of Lister and Blackstone diesel engines and other equipment manufactured by R. A. Lister & Co. Ltd., of Dursley, Glos., and Blackstone & Co. Ltd., of Stamford, Lincs. The new company is Lister Blackstone Rail Traction Limited, with registered offices at Imperial House, 15-19, Kingsway, London, W.C.2.

The formation of this rail traction company marks the 120th anniversary of Blackstone & Co. Ltd.; the 90th year of R. A. Lister & Co. Ltd.; and the 21st anniversary of the association of the two firms since they were united in production in 1936.

In the 1920s, a three-cylinder 25-h.p. Blackstone oil-engined narrow-gauge 0-4-0 industrial shunting locomotive with side rods and reversing gearbox enjoyed a home and export demand. Within recent years Lister-Blackstone engines have been supplied in quantity to British Railways.

The Lister rail truck has been used on industrial sites and in tea, coffee, and sugar plantations throughout the world. These rail trucks are now being supplied with Lister air-cooled diesel engines. Lister engines have also been fitted in many low-

powered industrial type narrow gauge works locomotives, and are extensively in use overseas.

In the high power range available from the new company, the Lister-Blackstone ERT series of engines has been extended by the development of a twin-bank version with fabricated base and cylinder housings. These are available as 12- and 16-cylinder engines with crankshaft speeds of 800 r.p.m., built-in gearboxes, and output shaft speeds up to 1,250 r.p.m.

### Work Study School Opened at Harrogate

A new work study school was opened at Harrogate on October 28, by British Railways, North Eastern Region. It has been established in new premises near Harrogate Station. The accommodation consists of a lecture room, demonstration and equipment room, library, workshop, and offices for the staff. Fifteen students from various departments in different parts of the Region are taking part in a course. Arrangements have been made for them to reside in a hotel in Harrogate.

Two main types of work study courses are being run under the supervision of the chief instructor at Harrogate, Mr. W. D. Andrews. Ten-week courses aim at giving an intensive training in the methods and procedures required for carrying out detailed investigations and preparing work study schemes. One week appreciation courses are planned for staff in more senior grades, to give them in concise form a fuller knowledge of the aims and principles used by work study practitioners.

The emphasis in the training courses is on practical work both on transport and other industrial projects. Some exercises are being reproduced in the demonstration room, others take place at nearby B.T.C. installations or in local works. The importance of human relations occupies a prominent position throughout the training. It is planned to give those attending the 10-week courses a further period of practical experience upon various actual projects under expert guidance before they undertake independent enquiries.

The official opening ceremony was per-



Two of the standard type 0-6-0 350-b.h.p. British Railways diesel shunting locomotives powered with Lister-Blackstone ERT diesel engines

formed by Mr. Geoffrey Kitson, Acting Chairman of the North Eastern Area Board. Mr. Kitson was introduced by Mr. A. R. Dunbar, Assistant General Manager, North Eastern Region. Mr. A. G. Kentridge, Principal of the B.T.C. Work Study Training Centre, Watford, and Mr. W. D. Andrews, Chief Instructor of the new school also spoke.

The following regional officers were present at the ceremony: Mr. F. Grundy, Chief Traffic Manager, North Eastern Region; Mr. A. Dean, Chief Civil Engineer, North Eastern Region; Mr. M. G. Burrows, Chief Mechanical & Electrical Engineer (Designate) North Eastern Region; Mr. A. F. Wigram, Signal Engineer, North Eastern Region; Mr. S. W. Jesper, Public Relations & Publicity Officer, North Eastern Region; Mr. W. O. Gay, Chief of Police, Northern Police Area; Mr. S. J. Judson, Assistant Regional Establishment & Staff Officer, North Eastern Region; Mr. C. L. Smith, Assistant Estate & Rating Surveyor, North Eastern Region; and Mr. C. A. Haygreen, Assistant to Chief Traffic Manager (Planning), North Eastern Region.

## B.U.T. Training for British Railways Diesel Staff

The steadily increasing use of British United Traction diesel railcar transmission units by British Railways has resulted in the need for training railway engineers on these components. British Railways are arranging for staff to be sent to the B.U.T. training school at Leyland.

In view of the large number of orders for railcar transmissions, British Railways, it is stated, have booked the school for a considerable period.

During the three-day course, staff are instructed in the salient features of the B.U.T. rail traction car unit together with its associated transmission unit and control gear, which is of a type now being supplied for the majority of the lightweight multiple-unit diesel trains. During the course trainees make use of a reproduction of part of a railcar underframe, with driv-

ing units and controls. Towards the end, they are shown the various stages of the construction and testing of railcar engines in the Leyland factories.

The company states that nearly 1,300 railcar engines have already been delivered to British Railways, and orders for a further 1,700 representing total contract values of over £7 million have now been placed.

## Staff and Labour Matters

### Railway Wage Claim

A meeting of the Railway Staff Joint Council comprising representatives of the B.T.C. and of the three railway trade unions was held on October 24, 1957, to hear claims by the N.U.R. for a substantial increase in rates of pay for railway salaried and conciliation staff and by the A.S.L.E.F. for a 10 per cent increase in the rates of pay of railway footplate grades. The Commission representatives undertook to give a considered reply to the submissions at a further meeting which is to be arranged.

### Additional Leave

Following a resolution carried at the annual general meeting of the N.U.R. this year, the union has now submitted a claim to the B.T.C. for a further week's winter leave to be granted to salaried and conciliation staff of British Railways.

### London Transport Pay Claims

The National Union of Railwaymen has presented a claim for a "substantial" wage increase and a reduction in working hours to 40 a week to the London Transport Executive. The Associated Society of Locomotive Engineers & Firemen has presented a claim for a 10 per cent increase for its members employed by London Transport. The two claims together would affect some 18,000 employees and would cost £1 million a year.

London Transport is already facing a demand for a 25s. a week increase for 53,000 busmen. This would cost some £4 million in a full year.



View of the arrangement of railcar underframe and controls used at the British United Traction training school

## Gloucester Railway Carriage & Wagon Co. Ltd.

At the annual general meeting of the Gloucester Railway Carriage & Wagon Co. Ltd. on October 25, General Sir William D. Morgan, the Chairman, presided. In his circulated statement he reported an improvement in the financial results for the year ended May 31, 1957, and stated that the parent company had reaped some benefit from long term contracts which had been completed within the year under review.

Steel supplies improved during the year but still remain inadequate to meet growing requirements. A wide range of vehicles was produced for the home and overseas railways. Of special interest were two prototype coaches delivered recently to British Railways and the seven-car prototype lightweight tube train for London Transport.

The company, he added, had been active in diesel car production, and was at present producing lightweight twin-car diesel units for British Railways, embodying special features of a new tubular design, in collaboration with Tube Investments, Limited. Orders had also been obtained for a substantial number of coaches from the Rhodesia Railways against intense competition from Continental and other sources.

Referring to the subsidiary companies, Sir William Morgan stated that after the small loss incurred by William Gardners during the previous year while building operations were in progress, advantage had been taken of the facilities provided by the new extensions and the trading year had produced a record sales figure.

Trade investments were confined to Wagon Repairs Limited and Philblack, Limited. The former company had enjoyed another successful year from which a considerable increased profit had resulted. The profits of Philblack, Limited for the year ended March 31, 1957, were substantially lower than those of the previous year.

The financial results for the year ended May 31, 1957, were reported in our issue of October 11.



Instruction on a railcar component being given to trainees

## Contracts and Tenders

### South African Railways orders for rolling stock

South African Railways have recently placed the following contracts:

Wegmann & Company, Kassel, West Germany: nine air-conditioned dining cars together with nine kitchen cars at a total cost of £485,131.

Ateliers de Construction de Familleureux, Belgium: 500 goods guards vans at a total cost of £1,753, 951.

British Railways, Scottish Region, have placed the following contracts:—

Webster, Bannerman & Co. Ltd., Glasgow: repairs to engine pits and new concrete roadways, St. Rollox Motive Power Depot, Glasgow

The Lanarkshire Welding Co. Ltd., Wishaw: steel deck units and main girders for bridge No. 3, Kilwinning, and sub-structure of new underbridge, Langbank

Kings & Co. Ltd., Glasgow: roadway repairs, Galashiels

Murdoch, Mackenzie Limited, Motherwell: site work, reconstruction of bridge No. 8, Kilwinning, and sub-structure of new underbridge, Langbank

Sovex Limited, Erith, Kent: conveyor installation, creosoting depot, Greenhill

John Stirk & Sons Ltd., Halifax: two planing machines, St. Rollox Works, Glasgow

Westinghouse Brake & Signal Co. Ltd., London: provision of colour light signalling, Newton

The Special Register Information Service, Export Services Branch, Board of Trade, has received calls for tenders as follows:—

#### From Portuguese East Africa:

40 petrol tank wagons.

The issuing authority is the Ports, Railways and Transport Department, Lourenço Marques. The closing date is November 22, 1957. Bids should be accompanied by a provisional deposit of Esc. 325,000. Specifications and drawings may be obtained from the Railway Warehouse at Lourenço Marques. The Board of Trade reference is ESB/25794/57.

#### From Australia:

50 traction motor gear wheels to Corporation's drawing M Car 8047.1 with small bore

200 traction motor pinions to Corporation's drawing M Car 8047.2

The gear wheels and pinions shall be suitable for use on suburban motor coach bogies which are equipped with General Electric Company reversible traction motors No. 237A, 750/1,500 V. d.c., rated for 1 hr. at 140 h.p.

The issuing authority is the Victorian Railways. The tender No. is 61,237. Bids should be sent to the Secretary for Victorian Railways, Railways Administrative Offices, Melbourne, C.1. The closing date is November 27, 1957. The Board of Trade reference is ESB/25259/57.

#### From Sudan:

300,000 bearing plates.

The issuing authority and address to which bids should be sent, accompanied by a 2 per cent deposit, is the Controller of Stores, Sudan Railways, Atbara. The closing date is November 25, 1957. Specification and relative drawings can be obtained on application to the Controller

of Stores, Atbara. The Board of Trade reference is ESB/25662/57.

#### From South Africa:

750 diaphragms van valve CME.71/02852/360

50,000 diaphragms vacuum release valve CME.71/02849-360

20,000 pipes vacuum hose 18 in. by  $\frac{1}{2}$  in. CME.71/02856-579/A

1,500 pipes vacuum hose 18 in. by  $\frac{1}{2}$  in. CME.71/02857/579/A

81,500 pipes vacuum hose 24 in. by 2 in. CME.71/02859-579

3,000 rings joint 15 in. dia. cylinder CME.71/02936-360

21,500 rings joint, 18 in. cylinder dia. CME.71/02933-360

33,000 rings joint, 21 in. dia. cylinder CME.71/02930/360

2,500 rings, joint, 24 in. dia. cylinder CME.71/02937-360

1,000 rings, rolling 15 in. dia. cylinder CME.71/02935-360

31,500 rings, rolling 18 in. dia. cylinder CME.71/02932-360

25,000 rings, rolling 21 in. dia. cylinder CME.71/02931-360

1,000 rings, rolling 24 in. dia. cylinder

CME.71/02934-360

91,500 rings packing piston rod gland CME.71/02929-360/C

2,500 washers, Coupling  $\frac{1}{2}$  in. CME.71/02989-360

1,000 washers, Coupling 1 $\frac{1}{2}$  in. CME.71/02992-360

126,500 washers, Coupling 2 in. CME.71/02991-360.

The issuing authority is the Stores Department, South African Railways. Bids in sealed envelopes, endorsed "Tender No. H.6843: Vacuum Brake Gear (Rubber Parts)" should be addressed to The Chairman of the Tender Board, P.O. Box 7784, Johannesburg. The closing date is November 15, 1957. The Board of Trade reference is ESB/25882/57.

Further details regarding the above tender, together with photo-copies of tender documents, can be obtained from the Branch (Lacon House, Theobalds Road, W.C.1).

## Notes and News

**Accident in Turkish Thrace.**—A telegram has been sent to the Director-General of the Turkish State Railways by Sir John Benstead, Deputy Chairman, British Transport Commission, conveying the condolences of the Commission at the railway accident at Ispartakule, in Turkish Thrace, reported in our issue of October 25.

**Western Region Fire Drill Competitions.**—The Western Region fire drill competitions were held at Marylebone Station, London, on October 15. The winning teams were: Two-man bucket/extinguisher drill—Paddington (Commercial); three-man

hydrant drill—Swindon Mechanical & Electrical Engineering; five-man trailer pump drill—Swindon M. & E.E. The presentation of awards was made by Mr. K. W. C. Grand, General Manager of the Region; the accompanying illustration shows him presenting the shield to the Paddington (Commercial) team.

**Two Successes for B.T.C. Films.**—"Men on the Mend," a film produced by the British Transport Commission, gained a premier award at the recent Harrogate Festival of Films for Service in Industry; it was awarded first prize in the "Human Relations in Industry" section. Another B.T.C. film, "Safe Transit," was awarded second prize in the "Training Inside



Mr. K. W. C. Grand presenting the shield to the Paddington (Commercial) team, winners of the two-man bucket/extinguisher drill

Industry" section. "Men on the Mend," which earlier this year gained a second prize at the International Congress of Occupational Health in Helsinki, deals with a rehabilitation workshop in Swindon for railwaymen who have suffered injury either at work or elsewhere. "Safe Transit," a staff training film, features the proper handling methods for different kinds of railway freight traffic.

**Institute of Transport Annual Anniversary Luncheon.**—The principal guest at the Institute of Transport annual anniversary luncheon to be held at the Connaught Rooms, Great Queen Street, W.C.2, on November 12, will be Lord Mills, Minister of Power. The President of the Institute, Sir Reginald Wilson, will be in the chair.

**London Transport Green Line Routemaster Coach.**—The caption to the illustration showing the new London Transport Green Line motorcoach in last week's issue stated that the builder was Leyland Limited. This should have read Eastern Coach Works Limited, with mechanical units by Leyland Limited.

**Derailment in Argentina.**—An express train from Buenos Ayres to Zapala, on the General Roca Railway, was derailed on October 24 near Fortin Uno, some 190 miles from Bahia Blanca. It is understood that an axle of a tank wagon on the train broke, derailing the tank wagon, two vans, two coaches and the restaurant car. Twelve passengers were killed and 37 injured.

**Proposals to Reduce Iron and Steel Tariffs.**—The Council of Association between the Government of the United Kingdom and the High Authority of the European Coal & Steel Community reached, on October 24, full agreement on proposals to be sent to the Government of the six Community countries and the British Government, for a substantial reduction of iron and steel tariffs in the United Kingdom and the

Community. The Council was meeting in Luxembourg for its sixth session since its inception. Mr. Reginald Maudling, Paymaster General, led the United Kingdom delegation. The proposals invite the Government to conclude an agreement by which the United Kingdom would reduce its customs duties on a wide range of iron and steel products from the current level of 15-33½ per cent ad valorem to a level not exceeding 10 per cent with an appropriate adjustment of the alternative specific rates. The member states of the Community will apply rates not exceeding those resulting from the harmonisation of their customs duties at the end of the transitional period. These maximum rates will vary between 3 per cent and 12 per cent ad valorem.

**Trials of Experimental 450-b.h.p. Diesel-Electric Set.**—The Eastern Region has been carrying out trials between Kings Cross and York, and Kings Cross and Sheffield of an experimental two-car set fitted with diesel-hydraulic transmission. The vehicles have been converted from multiple-unit stock which formerly worked on L.M.S.R. services from and to Broad Street, and consist of two North London electric passenger coaches. Power is obtained by a Davey, Paxman 450-b.h.p. engine mounted under the floor, driving a generator, to supply the original axle-mounted traction motors. It is reported that on one run between Doncaster and London an average speed of 63 m.p.h. was achieved.

**Private Transport Affects Bus Receipts.**—Giving evidence at a bus fares inquiry at Luton on October 28, Mr. W. R. Hargrave, on behalf of United Counties Omnibus Co. Ltd., stated that in September the number of bus passengers had fallen by some 750,000 compared with September, 1956. In the last two or three months, he stated, the public had been turning to alternative forms of transport, particularly

private motorcars and bicycles, and there might be a loss of 9 million passengers in a full year. The company was given permission to raise certain fares by 1d. and to reduce the mileage covered by some other fares. Similar permission was given to Luton Corporation Transport.

**Careers on East African Railways.**—A booklet describing opportunities for employment on East African Railways has been published by the East African Railways & Harbours Administration. It is directed particularly at young men in search of a career, and gives details of all the training schemes operated by the Administration. Information on salaries, conditions and promotion prospects is also given. The booklet can be obtained from the General Manager's Office, P.O. Box 30121, Nairobi.

**Cockfosters Station Car Park Extension.**—Car park accommodation at Cockfosters Station, Piccadilly Line, London Transport, will be trebled from November 4, when an additional park for 72 cars will be opened on the south side of the station. The original car park on the other side of the station will be retained.

**Driver Acquitted of Being Drunk on Duty.**—At Carlisle Quarter Sessions on October 25, a driver of a multiple-unit diesel train to Newcastle was found not guilty, after a three-day trial, of being drunk on duty at Carlisle on August 17. Various witnesses had stated that the driver staggered on the platform as he approached the train and slumped over the controls after it started. A woman passenger pulled the communication cord and stopped the train as it left Carlisle. There was no medical evidence as to the driver's condition on the night in question, but a neurological specialist stated in evidence that the driver suffered from a medical condition which made him unsteady as he walked.

**Finals of British Railways Fire-Fighting Competition.**—The finals of the British Railways sixth Inter-Regional Fire-Fighting Competition, in which over 500 teams competed in the eliminating rounds, were held at Marylebone Station on October 31. The competition is designed to stimulate interest and to increase the efficiency of both full-time and part-time fire brigade personnel and fire squads located at the large railway workshops, stations and depots throughout British Railways. The regional finalists competed in two-man extinguisher and fire bucket drill; three-man hydrant drill; and in five-man trailer-pump drill. Mr. J. W. Watkins, Member of the British Transport Commission, presented challenge shields to the successful teams in each section and miniature shields to each of the winning team members. Awards were also presented to the runners-up in each final.

**New Railway to be Built in Syria.**—The Russian mission which, as mentioned editorially in our issue of August 30, has been examining the possibilities of transport, irrigation and other works in Syria, has now completed its tour. An agreement for economic technical aid by Russia is believed to have been signed, or to be about to be signed, in Damascus. No details are available, but a loan of £65 million, repayable over a period of 12 years, is likely. Syrian sources suggest that the Russian mission has recommended that efforts should at first be concentrated

### London Transport Chairman in North America



At the recent annual convention in Montreal of the American Transit Association : (left to right) Mr. John E. McCarthy, President, Fifth Avenue Coach Lines ; Mr. Paul Dittmar, President, American Transit Association ; Sir John Elliot ; Mr. Charles Patterson, Chairman, New York City Transit Authority

on a railway from the port of Latakia, which is to be improved, to Qameshiya, on the Turkish border at the point where the Baghdad line re-crosses from Turkish into Syrian territory. This line, which would be some 300 miles in length, would cross the Homs-Aleppo line in the neighbourhood of Aleppo and run south of the border to Qameshiya. The construction from Aleppo eastwards would seem to be for political rather than transport reasons, as the present Baghdad line just on the Turkish side of the border has caused many disputes.

**Lee Guinness Control Gear Tests.**—A series of successful tests have recently been completed at the Chelmsford A.S.T.A. testing station of Crompton Parkinson on the contactors of A.S.E.A., Swedish, and Voigt and Haefner, German, designs, which Lee Guinness Limited is incorporating in the automatic control gear which the firm has under manufacture in Northern Ireland. References to the manufacturing projects were made in our issue of September 27 and October 25. Tests covered the full range of contactors to be used. All the contactors were graded as suitable for Class A.4 duty under B.S.S. 775.

**Public Service Vehicle Advertising Committee.**—The Public Service Vehicle Advertising Committee entertained at the English Speaking Union, on October 23, the President of the Institute of Practitioners in Advertising, Mr. Douglas M. Saunders; the Chairman of the Trade Relations Committee, Lt.-Colonel Alan M. Wilkinson, and other members of the Institute. Mr. J. H. Brebner, Public Relations Adviser to the British Transport Commission and President of the Committee, presided.

**Conference of European Ministers of Transport.**—The seventh session of the standing conference of European Ministers of Transport opened in Rome on October 24. The British delegation was led by Mr. Harold Watkinson, Minister of Transport & Civil Aviation. Among other matters, the conference was expected to discuss the co-ordination of inland transport by rail, road, and water in its relationship to the proposed wider European free trade area and the common market.

**Rolls-Royce Interim Dividend.**—An interim ordinary dividend of 5 per cent, as in the previous year, is to be paid on account of the year ending December 31, 1957, by Rolls-Royce Limited, on the capital as increased by a two-for-seven rights issue. The capital now consists of £9,290,000 ordinary stock and £398,795 workers' (1955) stock. In the first nine months of 1957 the turnover has shown an increase over that for the equivalent period of 1956. The net earnings, however, have risen at a lower rate because of the increased cost of wages and materials and a substantial advance in expenditure on research and development.

**Carnegie Award for London Transport Guards.**—Two London Transport guards who showed outstanding heroism in risking their lives to rescue a blind woman from the track at Finchley Road station in the peak-hour last January are to receive Carnegie awards next week in recognition of their bravery. They are Mr. Stanley O. Stone and Mr. Joseph A. Healy. On the northbound platform, separated from them by the two sets of Bakerloo tracks, the blind woman, a regular passenger at the

station, was walking towards the north end of the platform. She went too close to the platform edge and suddenly fell on to the northbound Bakerloo track, where she lay across one of the running rails. The two guards knew that the only member of the staff on the northbound platform was in the loud-speaker cabin and could not see what had happened. They jumped from the southbound platform, crossed the tracks to the far side, lifted the woman up to the platform, and managed to reach safety themselves before the next Bakerloo train arrived. Trains in both directions were due almost at once on the Bakerloo line, and tunnel curvature on the northbound line would have prevented the driver from seeing what was happening until almost in the station.

**North East Frontier Railway of India.**—An eighth railway is being created in the Republic of India by division of the present North Eastern Railway into two systems. One will continue to be known as the North Eastern Railway, with headquarters, as at present, at Gorakhpur. The North East Frontier Railway will include the present Pandu Region and the Katihar-Barauni section with some connected branch lines. Headquarters will be at Pandu. Both railways will be administered under the district system, i.e. that now obtaining on the present North Eastern Railway, but abolishing the regional layer superimposed on the districts. The residual North Eastern Railway will have seven districts and the North East Frontier Railway five. The date from which the two separate railways will be brought into existence has not yet been decided.

**Bridge Collapses Under Train.**—A bridge near Rossano, in Calabria, where the line of the Italian State Railways from Taranto to Reggio di Calabria skirts the Gulf of Taranto, collapsed under the weight of a goods train after being weakened by floodwater earlier this week. The driver of the train was killed and two other railwaymen were injured.

**Irish Channel Shipping Charges.**—The Government of the Republic of Ireland is to appoint a tribunal to inquire into the rates charged for freight on shipping services across the Irish Channel, many of which are provided by British Railways. The Minister for Industry & Commerce, Mr. Lemass, has stated that there is a growing volume of criticism of these charges. There has been some similar criticism in Northern Ireland.

**Quick Transit to Rhodesia via Benguela Railway.**—The results of a recent voyage of the Clan Line ship show that the present average of 35-40 days for carriage of goods from Liverpool to end destination in Central Africa has been significantly improved. The *Argyllshire* sailed from Liverpool to Lobito, Angola, in 13 days. In addition, cargo carried by the Benguela Railway from Lobito to the Northern Rhodesian Copperbelt has been at Ndola on recent occasions within seven days.

**Aid for Henschel Works.**—As reported in our issue of October 18, Henschel & Sohn G.m.b.H. recently appealed to Dr. Adenauer, Chancellor of the German Federal Republic, for special assistance to prevent the company's having to close down. It is now understood that the capital required is to be supplied from private banks and the Land Government of Hesse, and not partly from Federal

Government sources as was at first intended. The Federal Government, however, is to guarantee the necessary capital.

## Forthcoming Meetings

Open currently and until further notice.—  
British Transport Commission: Historical Exhibition "Transport Treasures" in Shareholders' Meeting Room, Euston Station, from 10 a.m. to 6 p.m. on weekdays, and 2 to 6 p.m. on Sundays. Admission 6d.

November 4 (Mon.).—Society of Engineers, in the Apartments of the Geological Society, Burlington House, London, W.1, at 5.30 p.m. Paper on "Hydraulics in industry," illustrated by lantern slides and a film, by Mr. R. H. Bound.

November 5 (Tue.).—Retired Railway Officers' Society, at the Mayfair Hotel, London, W.1, at 12.30 for 1 p.m. Annual autumn luncheon.

November 5 (Tue.).—South Wales & Monmouthshire Railways & Docks Lecture & Debating Society, in the Angel Hotel, Westgate Street, Cardiff, at 6.30 p.m. Paper on "Mechanisation in the Commercial Department," illustrated by lantern slides, by Mr. A. E. Flaxman, Assistant to Chief Commercial Manager, Western Region, Paddington.

November 11 (Mon.).—Institute of Traffic Administration, Birmingham Centre, at the Cosmopolitan Club, Fore Street, Birmingham, at 7.15 p.m. Paper on "Clearing house practice," by Mr. R. Clements.

November 11 (Mon.).—to November 13 (Wed.).—British Railways Staff Association, Inter-Regional Exhibition of Arts & Crafts, at Brunswick House, Vauxhall, London.

November 12 (Tue.).—Railway Correspondence & Travel Society, West Midland Branch, at the Arden Hotel, New Street, Birmingham, at 7.30 p.m. Mr. Clayton, a driver and M.I.C. lecturer at Bourneville shed, will discuss "Design and working of the locomotive."

November 13 (Wed.).—Railway Correspondence & Travel Society, Lancs & North West Branch, at All Saints' Rectory, Droylsden Road, Newton Heath, Manchester, at 7 p.m. Paper on "The North Eastern Railway," by Mr. T. Routhwaite.

November 13 (Wed.).—Railway Students' Association, at the London School of Economics & Political Science, Houghton Street, London, W.C.2, at 6.15 p.m. Paper on "The operation of urban railways in Germany, Russia and Sweden," illustrated by a film and lantern slides, by Mr. C. E. Dunton. Mr. A. H. Grainger, President, in the chair.

November 13 (Wed.).—Institution of Railway Signal Engineers, York Section, at the Signalling School, Toft Green, York, at 5.30 p.m. Paper on "Manufacture of lubricating oils and greases and their application to railway signalling equipment," by Mr. W. B. Broadbent, Mobil Oil Co. Ltd.

November 14 (Thu.).—Public Transport Association, at the Connaught Rooms, Great Queen Street, Kingsway, W.C.2; annual dinner.

November 14 (Thu.).—British Railways (Western Region) London Lecture &

Debating Society, in the Headquarters Staff Dining Club, Bishop's Bridge Road, Paddington, W.2, at 5.45 p.m. Paper on "The Press and the public," by Mr. C. Eade, Associated Newspapers Limited.

November 15 (Fri).—Railway Correspondence & Travel Society, London Branch, at the Railway Clearing House, Eversholt Street, London, N.W.1, at 7.15 p.m. Paper on "The Leek & Manifold Railway," by Dr. J. R. Hollick.

November 16 (Sat).—Railway Students' Association. Visit in the afternoon to Northfields Depot, London Transport Executive. Meet at Northfields Station booking hall not later than 1.45 p.m.

November 16 (Sat).—Permanent Way Institution, East Anglian Section, at Ipswich at 2.15 p.m. Demonstration of small tools by Messrs. Abtus, Limited.

November 16 (Sat).—Railway Correspondence & Travel Society, Bristol & District Branch, at the Grosvenor Hotel, Bristol, at 7.15 p.m. Paper on "Locomotives of the L.M.S.," by Mr. W. Potter.

## Railway Stock Market

There has been another setback in stock markets which put many industrial shares down to new low levels for the year, though British Funds held steady, helped by the strength maintained by the £. Earlier in the week there was a general tendency to await further news of Government plans for dealing with inflation, among which reduced expenditure by the nationalised industries is expected to feature prominently. Latest figures show that the banks have reduced loans by over £32,000,000. This is due partly to seasonal factors, and in particular the big fall in commodity prices but there are many indications that the credit squeeze is tightening, though the full effect of this will not become apparent until early next year. Wall Street after a sharp fall, rallied slightly, but has been dominated by fears of a decline of business activity in U.S.A.

Compared with a week ago, Canadian Pacifics have moved down further from \$51½ to \$50½. The 4 per cent preference stock was £56½ and 4 per cent debentures £62½. White Pass shares at \$15 compared with \$15½ a week ago and were at their lowest price this year.

Elsewhere, there were a fair number of dealings around 9s. 6d. in Nyasaland Railways shares.

Antofagasta ordinary stock has remained at 26, but the preference stock declined from 42 to 40½. Mexican Central debentures at 64½ were the same as a week ago. In other directions, business at 61½ was recorded in Dorada Railway Stock, and Brazil Railway bonds marked 4 and 5½, while United of Havana second income stock was 8½. Taltal shares kept at 14s. 3d. and San Paulo Railways units eased from 2s. 4½d. to 2s. 1½d. Business at 37 was marked in Chilean Northern debentures, while Costa Rica ordinary stock marked 16½.

The shares of locomotive builders and engineers have moved back with the prevailing market trend in industrial shares; the latter was affected by a number of dividend statements from well-known companies which emphasise that profits are reflecting higher costs and increased competition. Other reasons for the talk

of a less liberal dividend policy are the credit squeeze, the fear that bank loans will have to be cut; and uncertainty how long the Bank rate will remain at its high level of 7 per cent.

Westinghouse Brake came back from 30s. 3d. to 29s. 6d., Wagon Repairs 5s. shares were 11s. 9d., compared with 12s., Beyer Peacock 5s. units remained at 8s. 4½d., and elsewhere, Hurst Nelson were again 27s., but North British Locomotive eased from 11s. 9d. to 11s. 6d. Birmingham Wagon was again quoted at 15s. 6d. and G. D. Peters at 26s. 3d. Gloucester Wagon 10s. shares were 14s. 9d. and Charles Roberts 5s. shares 8s. 9d.

Associated Electrical have come back from 52s. 3d. to 51s. 6d., English Electric from 52s. 4½d. to 51s. 3d. and General Electric from 41s. 6d. to 41s., while Crompton Parkinson 5s. shares eased to 14s. 3d.

T. W. Ward lost 1s. at 66s. and Tube Investments at 55s. 6d. also reflected the general trend. British Oxygen (31s.) were again slightly higher because of general expectations that the 10 per cent dividend should be maintained. Renold Chain rallied to 30s. 6d., but British Aluminium lost further ground at 41s. 4½d., though elsewhere, shares of the Dowty Group have been well maintained at 30s. 3d. Pressed Steel 5s. shares were 13s. 1½d. British Timken eased to 49s. 3d. B.S.A. remained at 29s. 7½d. awaiting the full report and chairman's annual statement. Vickers came back to 31s., while Cammell Laird 5s. shares were 8s. 9d. and Ruston & Hornsby moved back to 23s.

## OFFICIAL NOTICES

**PERMANENT WAY DRAUGHTSMAN** required by Consulting Engineers near Victoria, London. Candidates should have had considerable experience in layout and design of track and ancillary works. Experience on Colonies Railways an advantage. Office hours 9.30 a.m. to 5.30 p.m. and one Saturday morning in six. For full particulars apply Personnel Department, Sir Bruce White, Wolfe Barry & Partners, 1 Lygon Place, Grosvenor Gardens, S.W.1. Telephone SLOane 0431.

**LOCOMOTIVE** Manufacturing Company in the North of England have an immediate vacancy for a MAN BETWEEN 22 and 30 years of age in their SALES AND SERVICE DEPARTMENT. Applicant must have locomotive shop experience and technical education up to Higher National Certificate standard. Good salary to suitable applicant. Pension scheme. Write in first instance giving full details of age, technical and practical experience to Box 458, *Railway Gazette*, 33 Tottishall Street, London, S.W.1.

**ASSISTANT FOREMAN PLATELAYER** required by the Steel Company of Wales Ltd., Abbey Works, Port Talbot. Applicants should be experienced in all sections of Permanent Way work and be able to lay points and crossings. This position is permanent and pensionable. Those wishing to apply should write giving full details of age, experience, present salary and any information considered relevant, quoting the reference 48/RG to:—Superintendent, Personnel Services, The Steel Company of Wales Ltd., Abbey Works, Port Talbot, Glam.

**RAILWAY DRAUGHTSMAN-SURVEYOR**, required by large firm railway contractors. Applicants must have ability to carry out site surveys, plot same in layout form to good working scale. (Detailing for manufacture of turnouts etc., done by other draughtsmen), capable of full use of Theodolite and level. Duties to include site supervision of contracts in progress. Age 23-30 years, man with British Standard Specification experience preferred. Conditions of employment to include provision of car, all travelling and general expenses, 5-day week on rota system, comprehensive superannuation scheme, etc.—Write in first instance, stating age, experience and salary required to: Rail Dept. Manager, Thos. W. Ward Ltd., Albion Works, Sheffield 4.

**THE BRITISH TRANSPORT COMMISSION** require TWO PRODUCTION ASSISTANTS at Swindon. Applicants should have had Mechanical Engineering training and experience of building locomotives and rolling stock, also must be capable of formulating building programmes and subsequent co-ordination of Design, Production Planning, Ordering of Material and the progressing of manufacture.

One post to cover Railway Rolling Stock including Diesel Multiple Units, the other Steam and Diesel Locomotives. Professional qualifications an advantage. Commencing salary £1,665 per annum rising by bi-annual increments to £2,125 per annum.—Applications to be addressed to the Chief Mechanical and Electrical Engineer, British Railways (Western Region), Swindon, Wilts.

**THE NIGERIAN RAILWAY CORPORATION** invites applications for the following post: **ASSISTANT ENGINEER** (Open Line). Duties: An Assistant Engineer may be required to take charge of an engineering sub-district on the Railway. This will include minor Capital Works projects. Qualifications: Candidates should have experience in railway engineering, bridge work and general building construction. They should preferably be Associate Members of the Institution of Civil Engineers or possess an Engineering Degree recognised as granting exemption from Parts I and II of the A.M.I.C.E. examination. They should have at least two years' practical experience in railway engineering. Salary: In scale £800 x £50 per annum to £1,600 per annum plus £300 per annum Overseas Pay. Starting salary according to qualifications and experience. Appointments may be on pensionable terms or on contract with 20 per cent. gratuity per annum of total pay. Tours: 15 months in Nigeria followed by 15 weeks' leave on full pay. Quarters: Partly furnished quarters are provided at low rental. Allowances: There are attractive family, travelling, transport and other allowances. Send postcard mentioning the post and this paper for further particulars and application form to:—The London Representative, Nigerian Railway Corporation, 11 Manchester Square, London, W.1.

## MOTORWAY AND MAJOR TRUNK ROAD IMPROVEMENTS IN THE WEST RIDING OF YORKSHIRE

In connection with the major road improvement programme authorised by the Ministry of Transport and Civil Aviation in the West Riding, and to be undertaken by the Highways and Bridges Department of the County Council, applications are invited for **JUNIOR ENGINEERING ASSISTANTS** in the grades A.P.T.I. to Special Grade (£575-£1,030).

Salaries will be within these grades according to qualification and experience.

The appointments offer candidates both design and practical experience in bridge works and road works, and the maintenance of roads, as it is expected that up to 50 miles of motorway and improved trunk roads will be under construction within eighteen months.

Applicants should state clearly for which post they apply.

Candidates for appointments in A.P.T. Special Grade must possess the necessary professional qualifications.

The appointments are permanent and subject to the provisions of the Local Government Superannuation Act, and the County Council regulations governing conditions of service, subsistence and travelling allowances. The successful candidates will be required to pass a medical examination.

Application forms and further particulars from the County Engineer and Surveyor, County Hall, Wakefield. Applications by 18th November, 1957.

**THE Nigerian Railway Corporation** invites applications for the following post: **SIGNAL AND TELEGRAPH INSPECTOR**. Duties: The officer will be required to undertake the installation and maintenance of Telephone Train Control equipment, to participate in the installation and maintenance of Electric Train Staff Instruments, and to assist with Double Wire Signalling Installations. Qualifications: Candidates must have working knowledge and experience of the installation and servicing of: (a) General Electric Company's Telephone Train Control apparatus; (b) Railway Signal Company's Electric Train Staff Instruments; (c) Mechanical Signalling apparatus particularly Double Wire apparatus as manufactured by the Westinghouse Brake & Signal Company. Preference will be given to Associate Members of the Institution of Railway Signal Engineers or Graduates of the Institution of Electrical Engineers. Salary: In scale £700 by £50 per annum to £1,200 per annum plus £300 per annum Overseas Pay. Starting salary according to qualifications and experience. Appointments may be on pensionable terms or on contract with 20 per cent. gratuity per annum of total pay. Tours: 15 months in Nigeria followed by 15 weeks' leave on full pay. Quarters: Partly furnished quarters are provided at low rental. Allowances: There are attractive family, travelling, transport and other allowances. Send postcard before 30th November, 1957, mentioning the post and this paper for further particulars and application form to: The London Representative, Nigerian Railway Corporation, 11 Manchester Square, London, W.1.

**FOR SALE OR HIRE**, Hudswell Clarke 0-6-0 standard gauge STEAM LOCOMOTIVE, in good condition.—Apply Eagre Construction Co. Ltd., Scunthorpe, Lincolnshire. 'Phone 4513 (7 lines).

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